

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Sorrells *et al.*

Appl. No. 09/855,851

Filed: May 16, 2001

For: **Apparatus, System, and Method
for Down-Converting and Up-
Converting Electromagnetic
Signals**

Confirmation No. 9178

Art Unit: 2681

Examiner: *(to be assigned)*

Atty. Docket: 1744.1260001

Letter to PTO Draftsman: Submission of Formal Drawings

Commissioner for Patents
Washington, D.C. 20231

Sir:

Submitted herewith are ninety-four (94) sheets of formal drawings with Figures 1A-1D, 2, 3A-3G, 4, 5, 6A-6B, 7A-7B, 8-12, 13A-13I, 14-15, 16A-16O, 17, 18A-18E, 19, 20A-20F, 21-23, 24A-24K, 25A-25F, 26A-26F, 27A-27E, 28-30, 31A-31C, 32-44, 45A-45E, and 46-62, corresponding to the informal drawings submitted with the above-captioned application. Identification of the drawing(s) is provided in accordance with 37 C.F.R. § 1.84(c). Acknowledgment of the receipt, approval, and entry of these formal drawing(s) into this application is respectfully requested.

It is not believed that an extension of time is required, other than any already provided herewith. However, if an extension of time is needed to prevent abandonment of the application, then such extension of time is hereby petitioned. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036. A duplicate copy of this Letter is enclosed.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Michael Q. Lee

Attorney for Applicants
Registration No. 35,239

Date: Nov 2, 2001

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TIMOTHY M. SPEER**
AARON L. SCHWATZ**

*LIMITED TO MATTERS
AND PROCEEDINGS BEFORE
FEDERAL COURTS & AGENCIES
**REGISTERED PATENT AGENT
***SENIOR COUNSEL

November 2, 2001

WRITER'S DIRECT NUMBER:
(202) 371-2674
INTERNET ADDRESS:
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Commissioner for Patents
Washington, D.C. 20231

Art Unit 2681

Re: U.S. Non-Provisional Utility Patent Application
Appl. No. 09/855,851 Filed: May 16, 2001
For: **Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals**
Inventors: Sorrells *et al.*
Our Ref: 1744.1260001

Sir:

Transmitted herewith for appropriate action are the following documents:

1. Letter to PTO Draftsman: Submission of Formal Drawings (*in duplicate*);
2. Ninety-four sheets of formal drawings (Figures 1A-1D, 2, 3A-3G, 4, 5, 6A-6B, 7A-7B, 8-12, 13A-13I, 14-15, 16A-16O, 17, 18A-18E, 19, 20A-20F, 21-23, 24A-24K, 25A-25F, 26A-26F, 27A-27E, 28-30, 31A-31C, 32-44, 45A-45E, and 46-62), approval of which is respectfully requested; and
3. One return postcard.

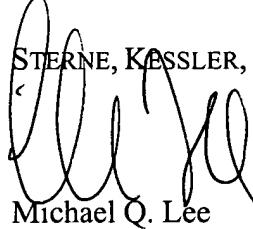
It is respectfully requested that the attached postcard be stamped with the date of filing of these documents, and that it be returned to our courier. In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

Commissioner for Patents
November 2, 2001
Page 2

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036. A duplicate copy of this letter is enclosed.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Michael Q. Lee
Attorney for Applicants
Registration No. 35,239

Enclosures

MQL/sjc
P:\USERS\VBEASTON\1744.1260001\DRAWING.CVR
SKGF Rev. 4/27/00 mac

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

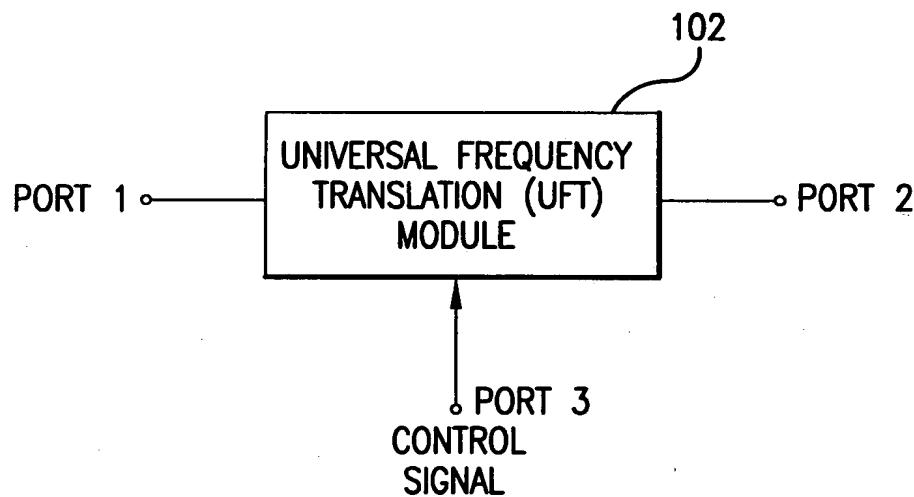


FIG. 1A

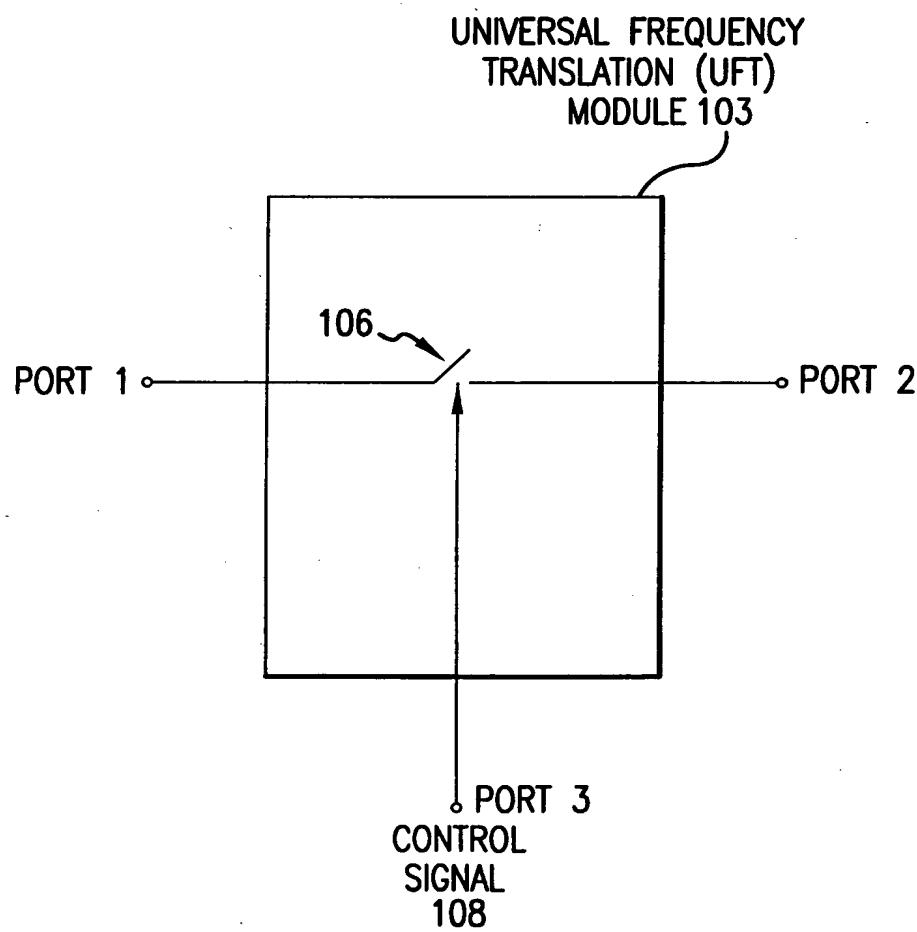


FIG. 1B

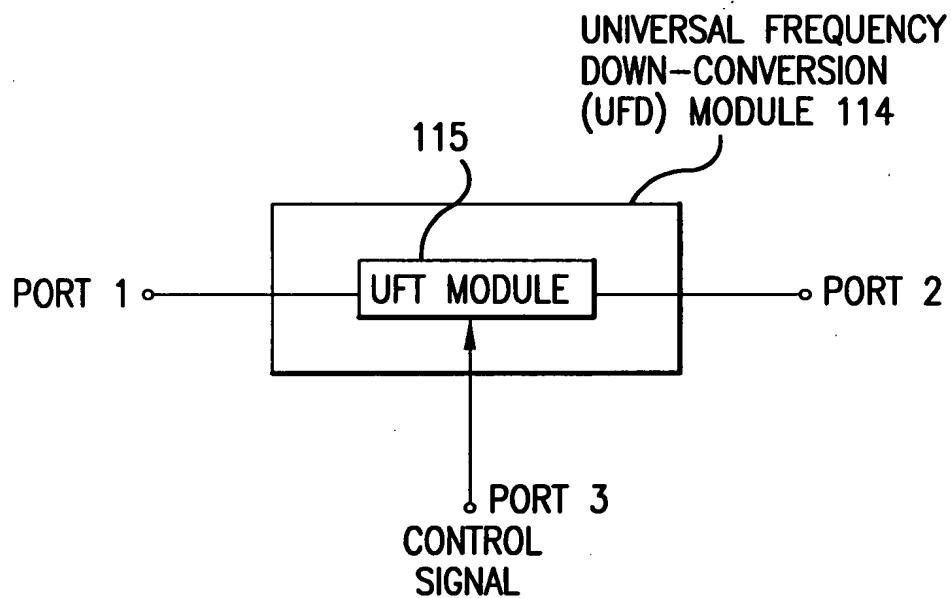


FIG. 1C

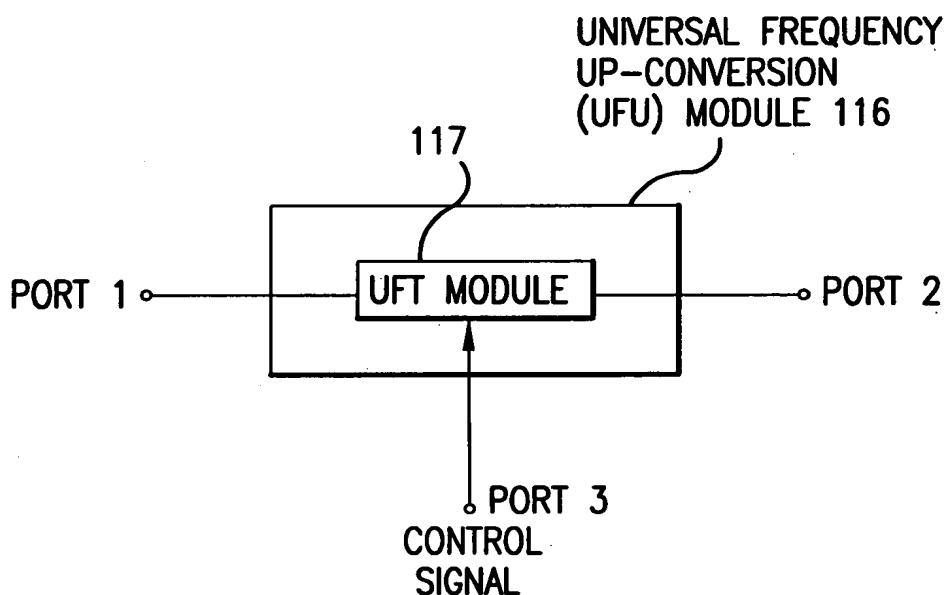
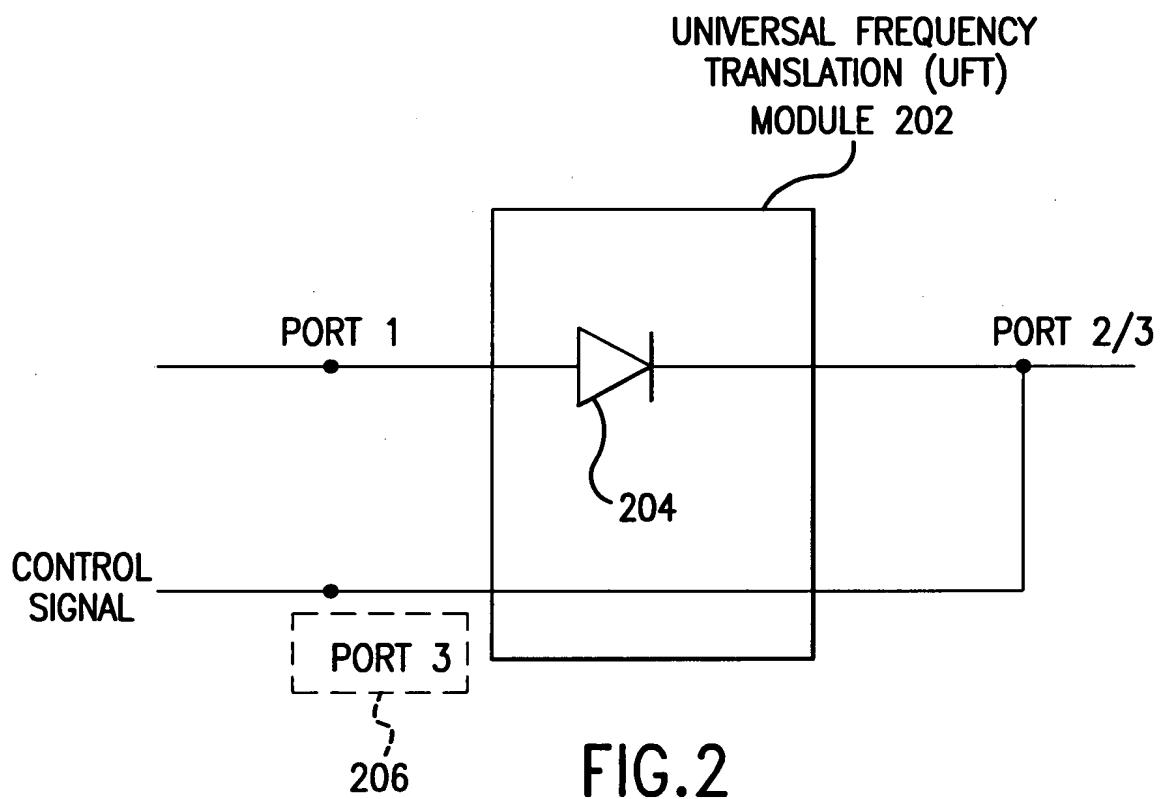


FIG. 1D

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorreis *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
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Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

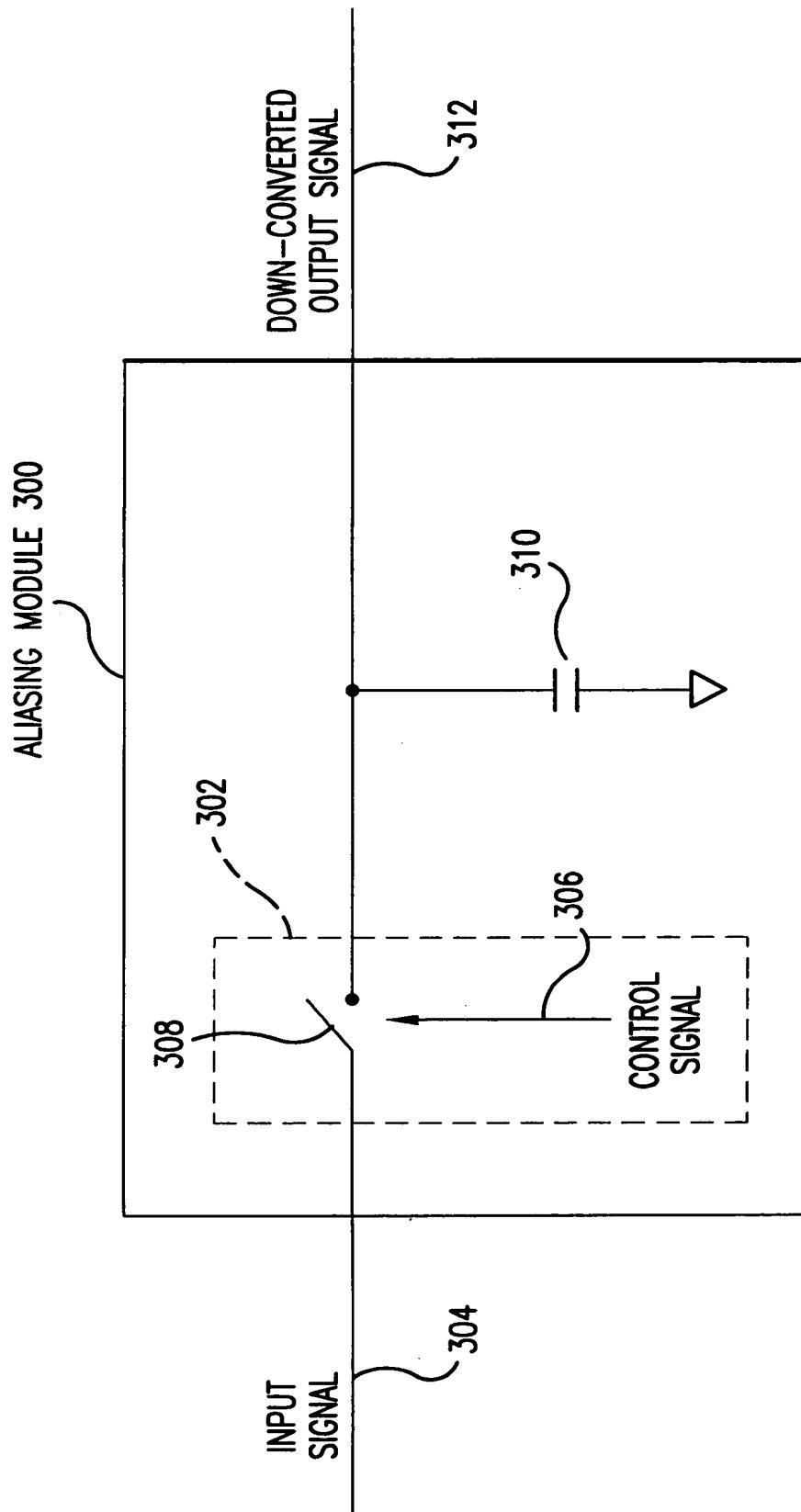
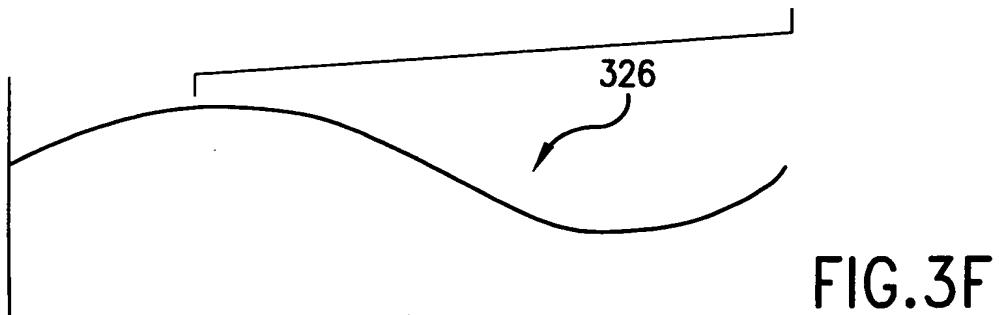
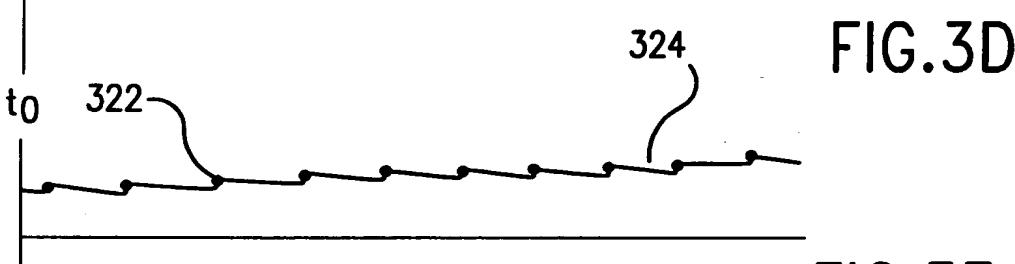
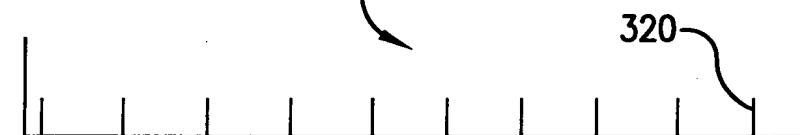
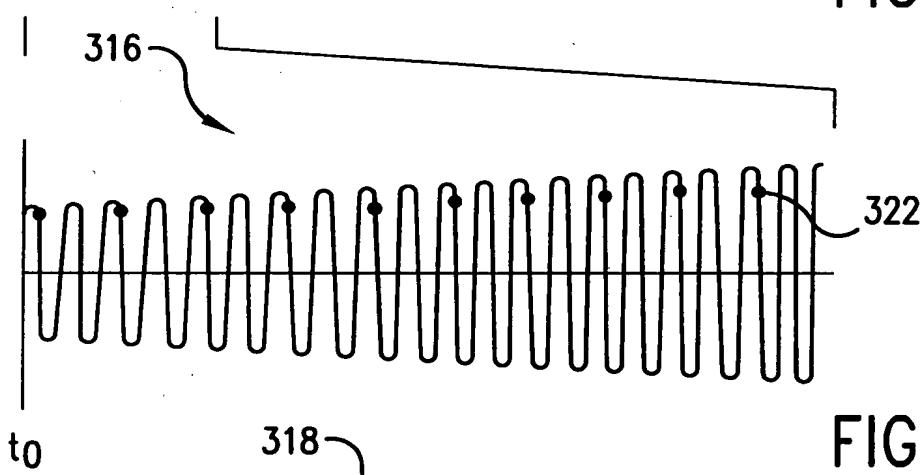
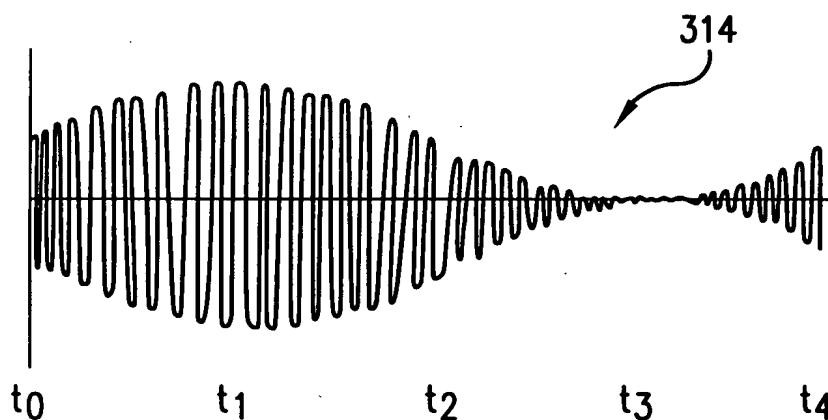


FIG.3A



Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.I1260001; Batch No.: (to be assigned)
Inventor(s): Sorrelle *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

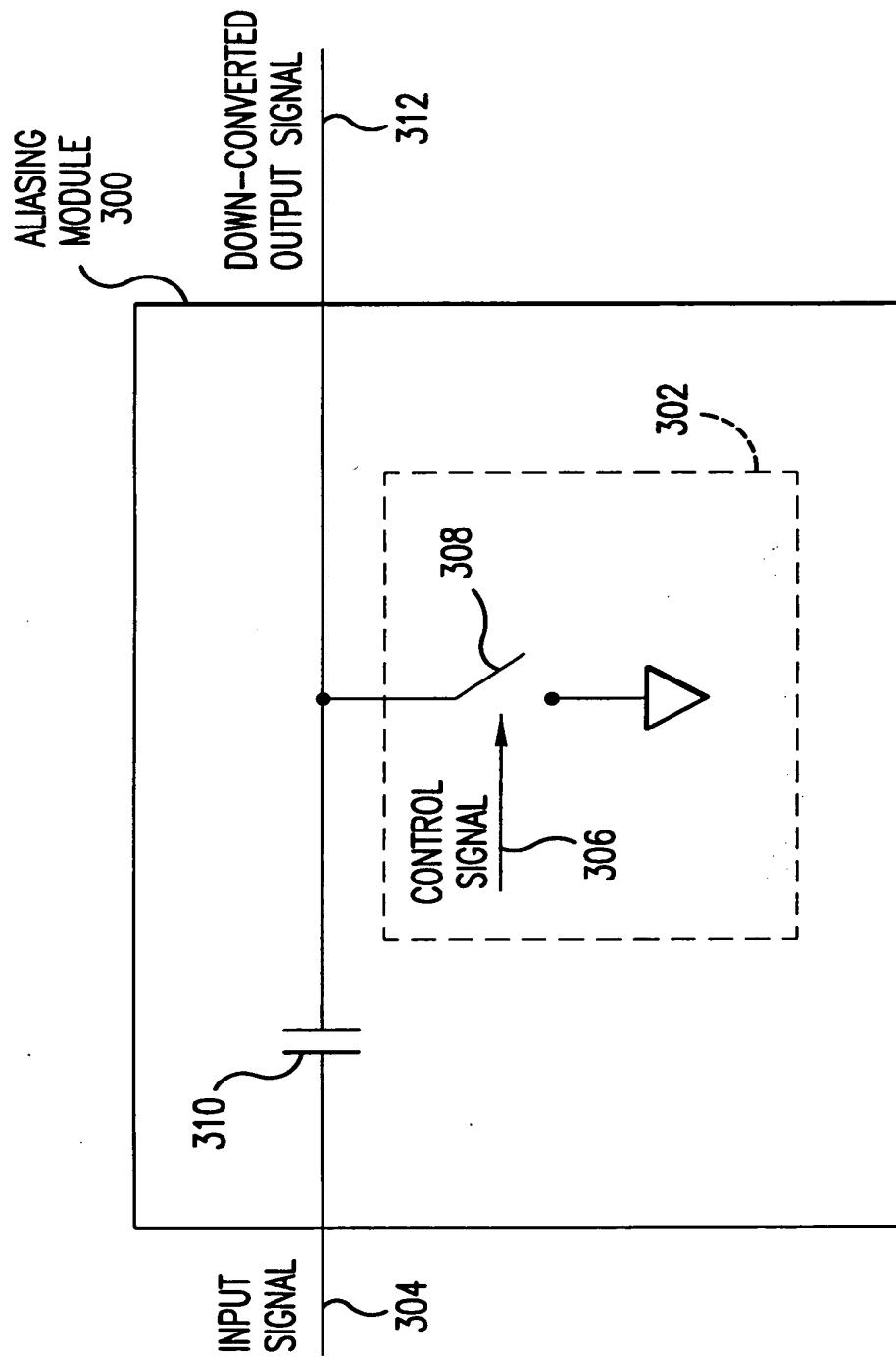


FIG. 3G

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Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
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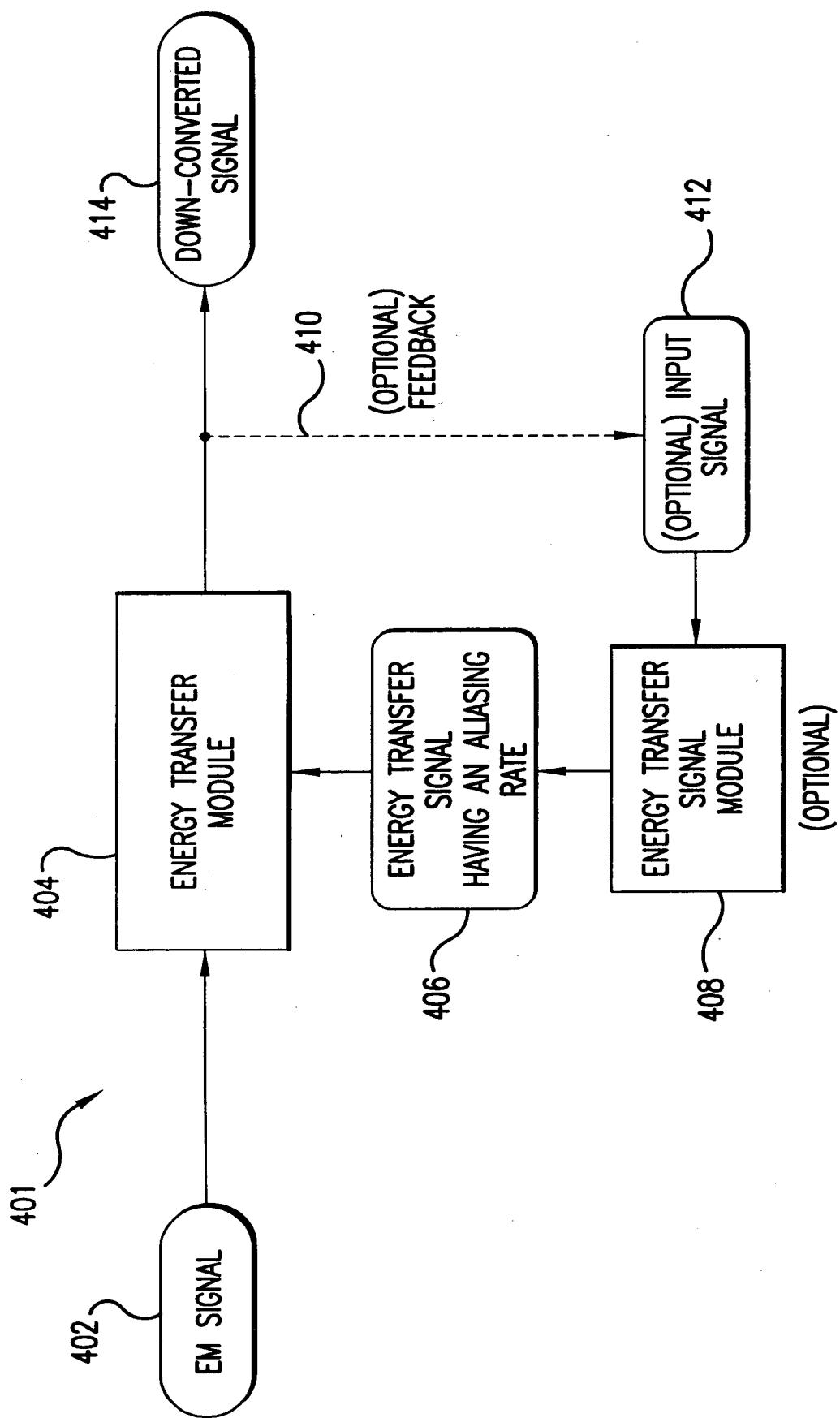


FIG. 4

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Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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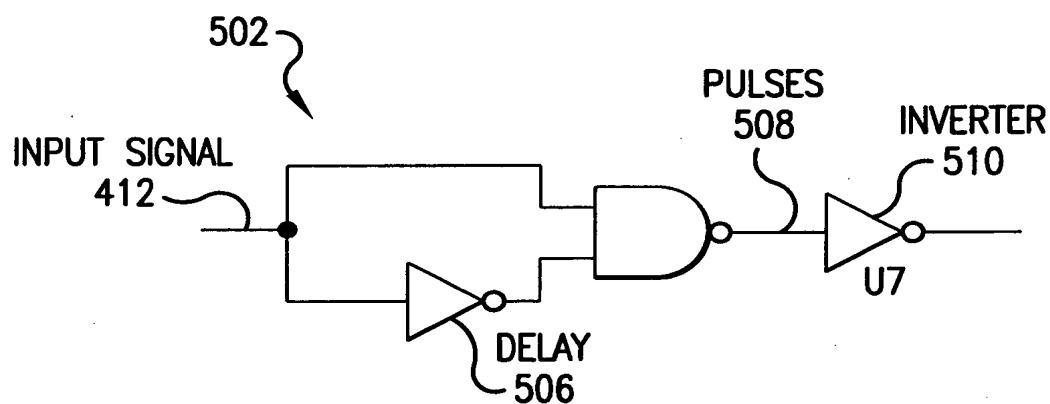


FIG.5

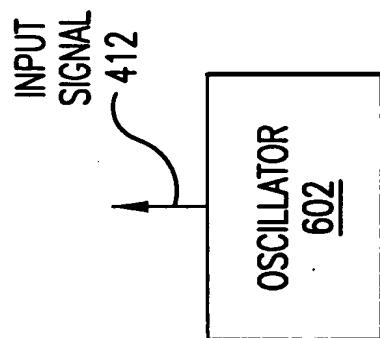


FIG. 6B

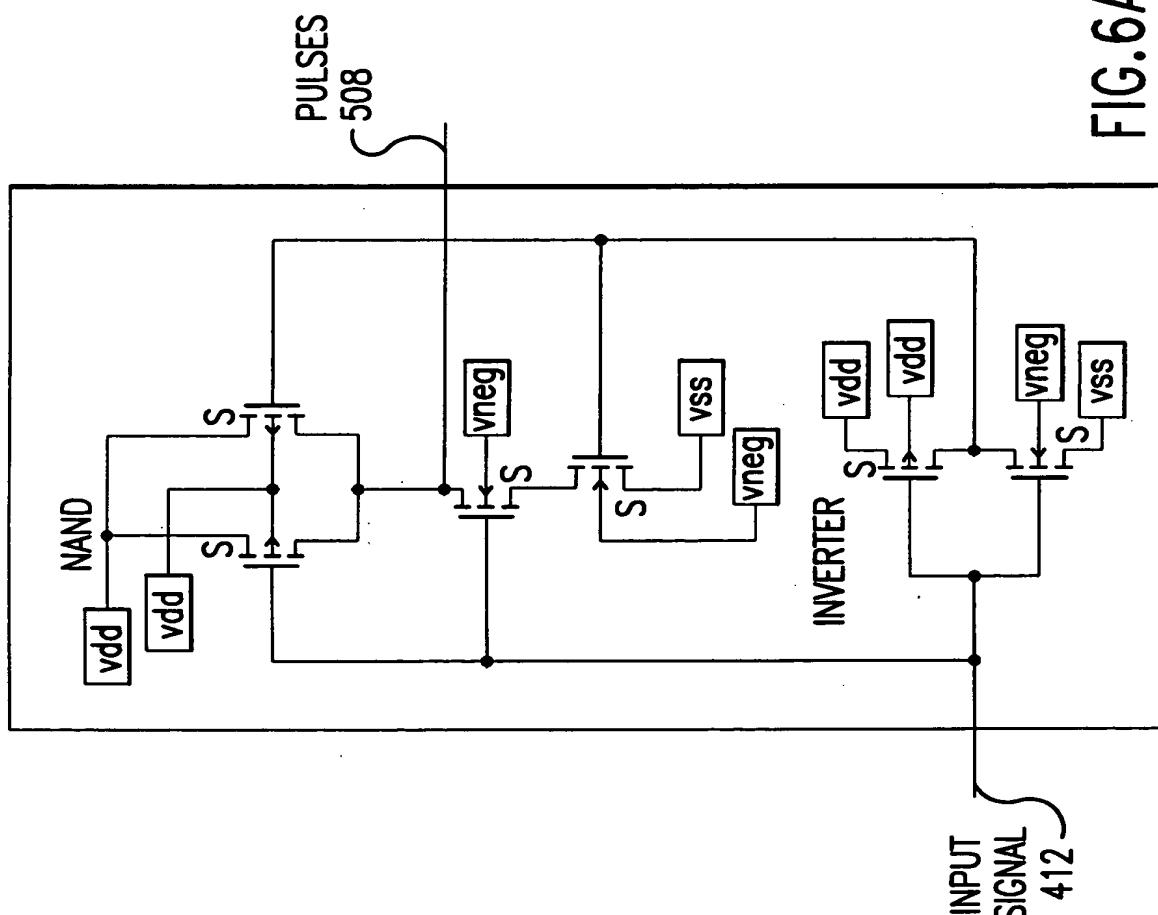


FIG. 6A

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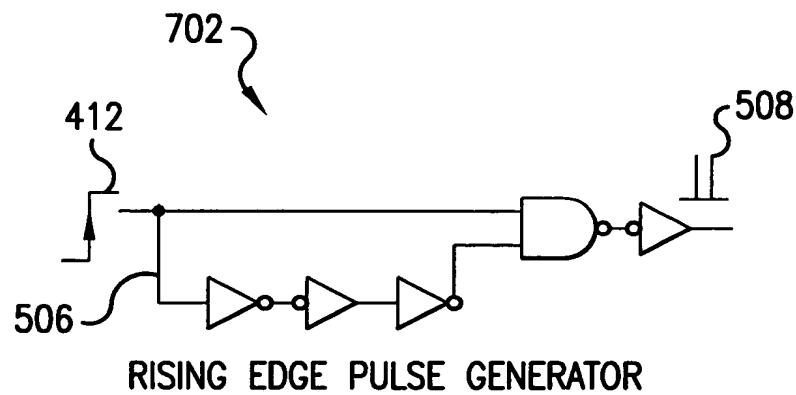


FIG.7A

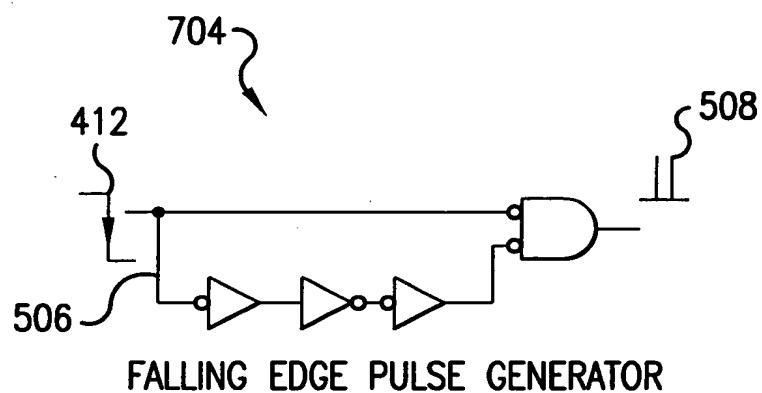
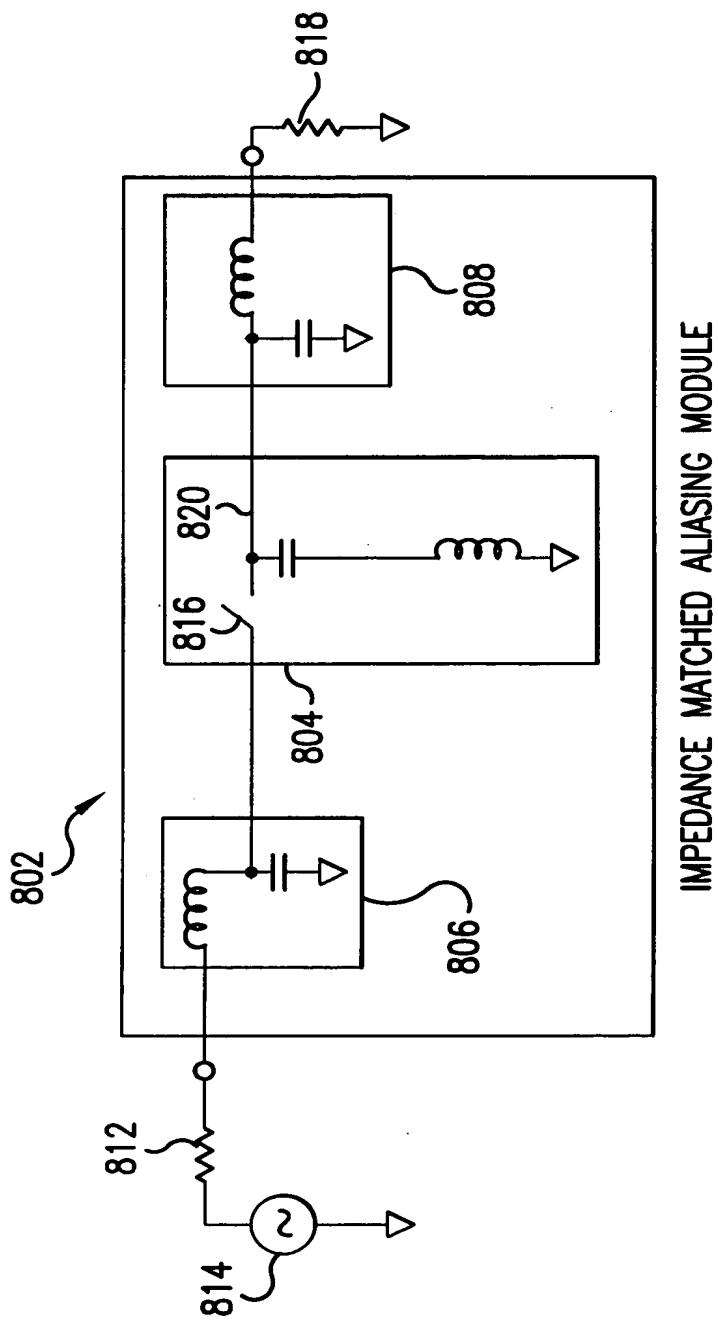
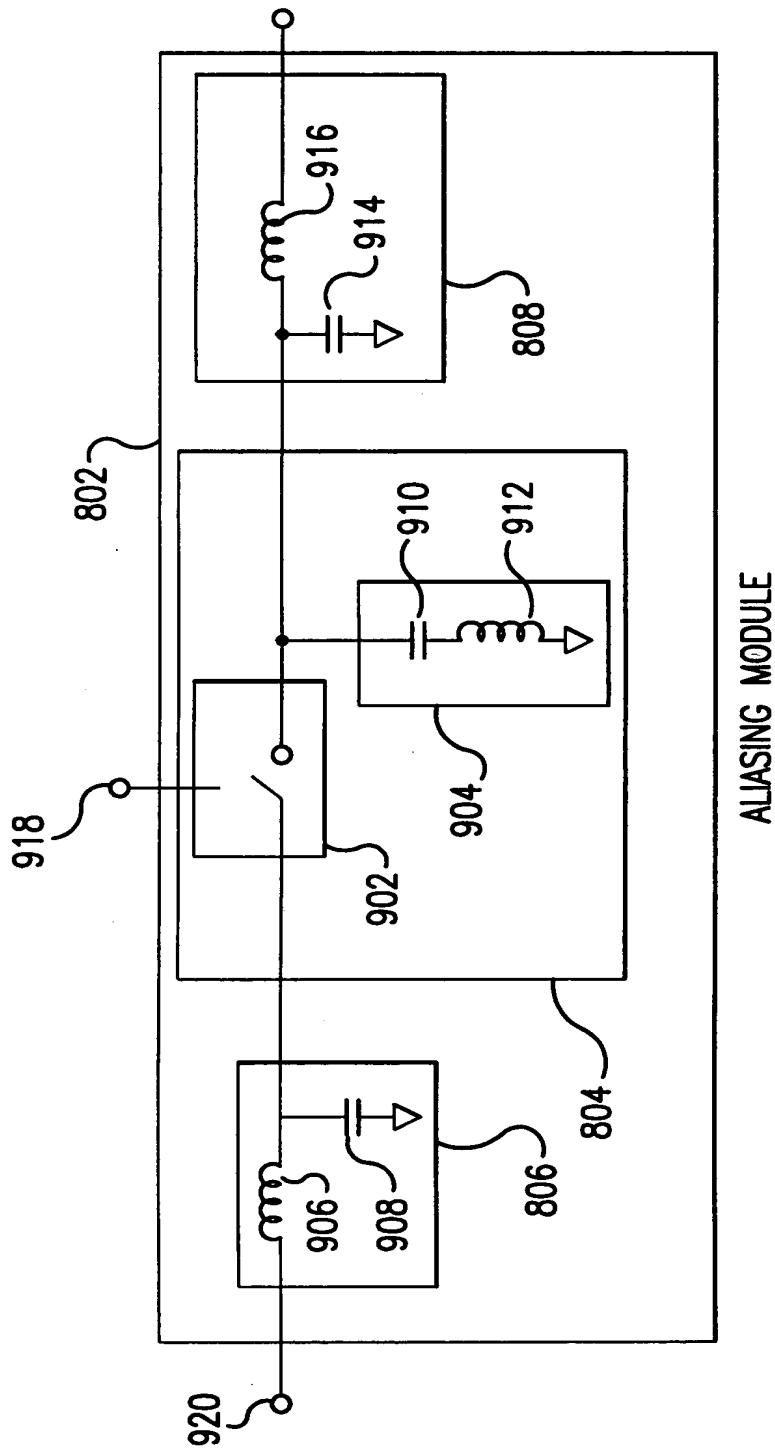


FIG.7B



IMPEDANCE MATCHED ALIASING MODULE

FIG.8



ALIASING MODULE

FIG.9

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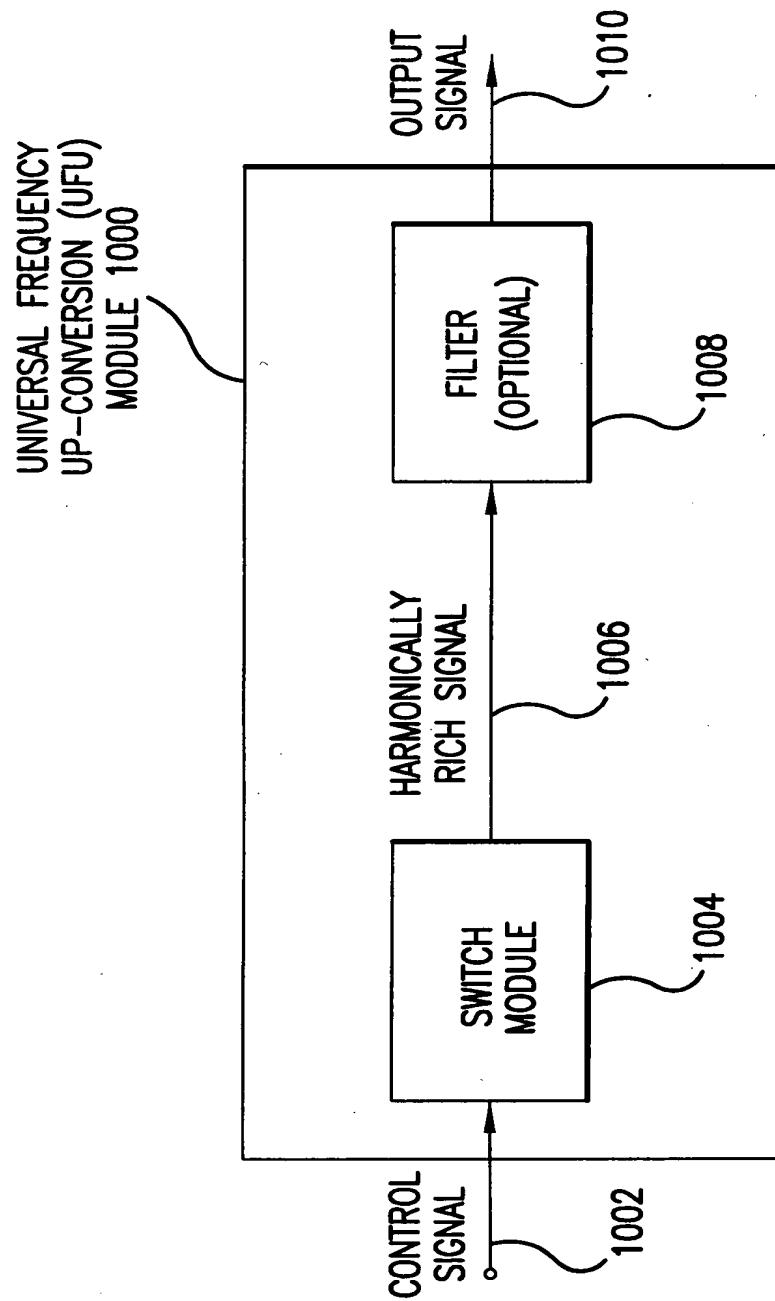


FIG. 10

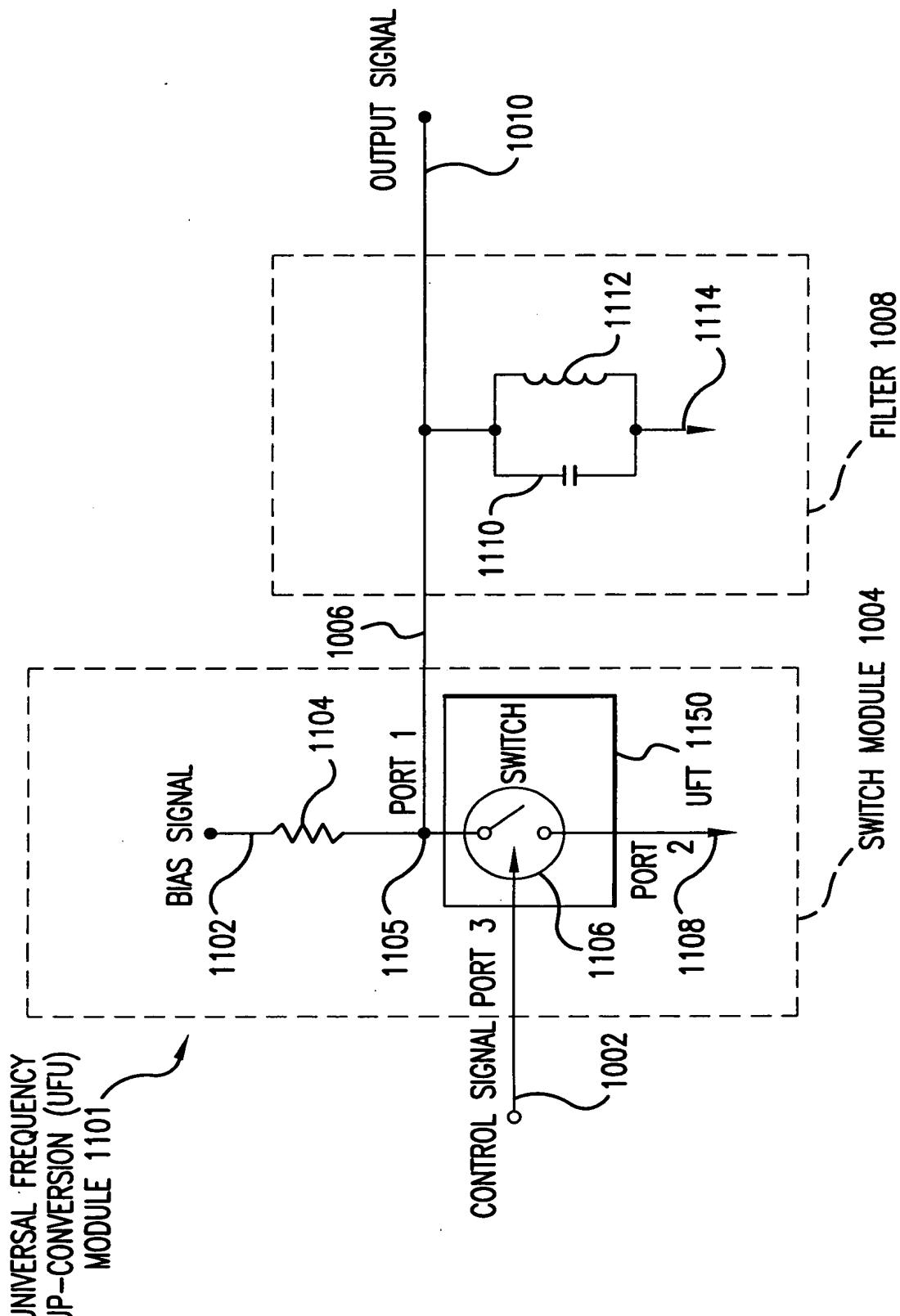
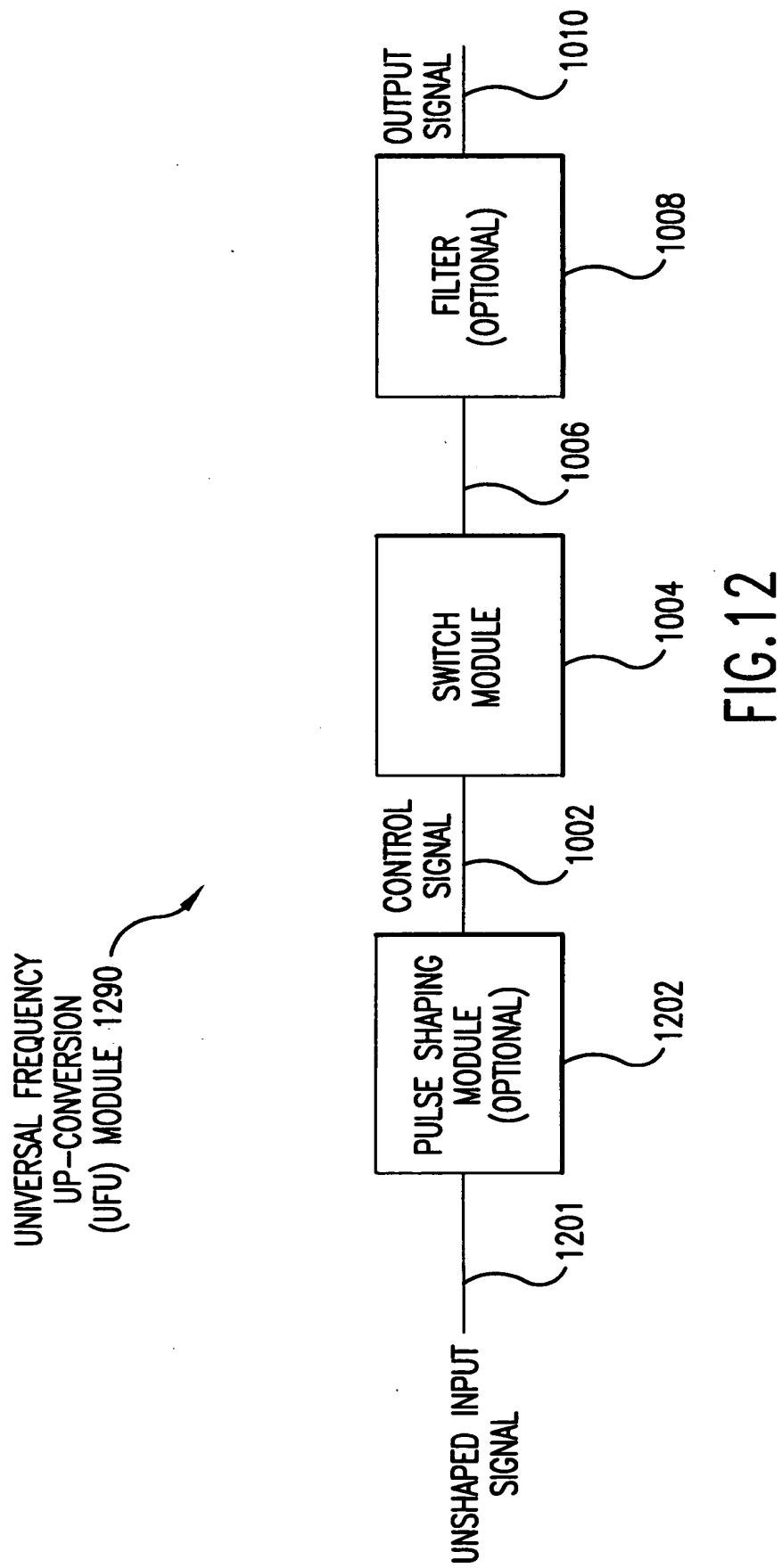


FIG. 11

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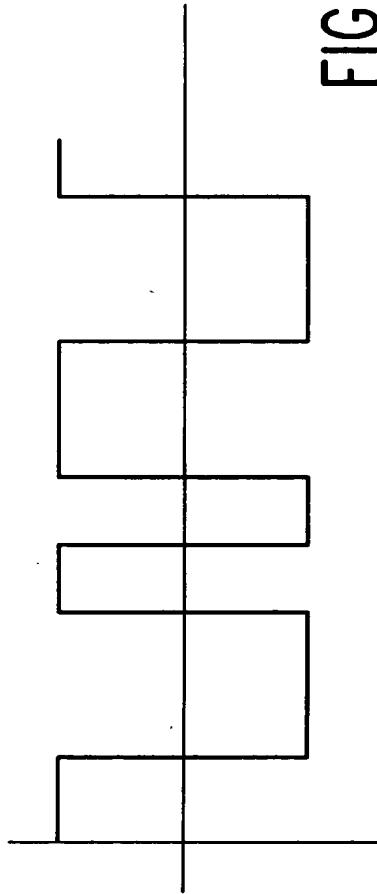


FIG. 13A

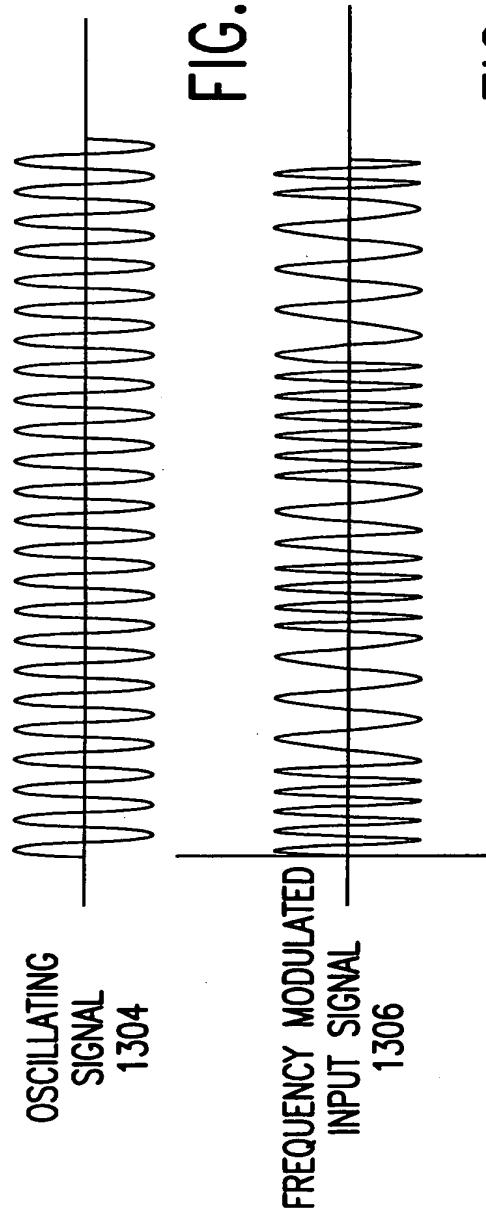


FIG. 13B

FIG. 13C

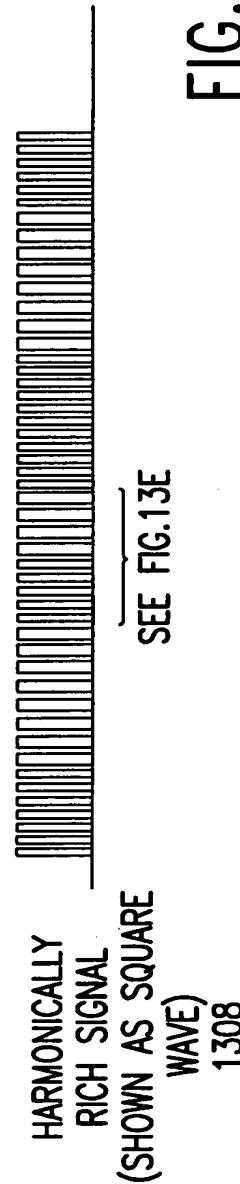


FIG. 13D

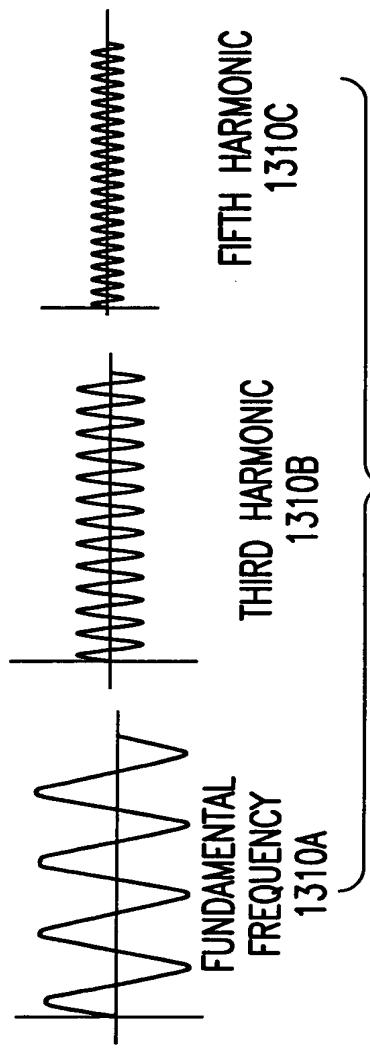
EXPANDED VIEW OF
 HARMONICALLY RICH
 SIGNAL 1308

1310

SEE FIG. 13F

FIG. 13E

HARMONICS OF
 SIGNAL 1310
 (SHOWN SEPARATELY)



HARMONICS OF
 SIGNAL 1312
 (SHOWN SEPARATELY)

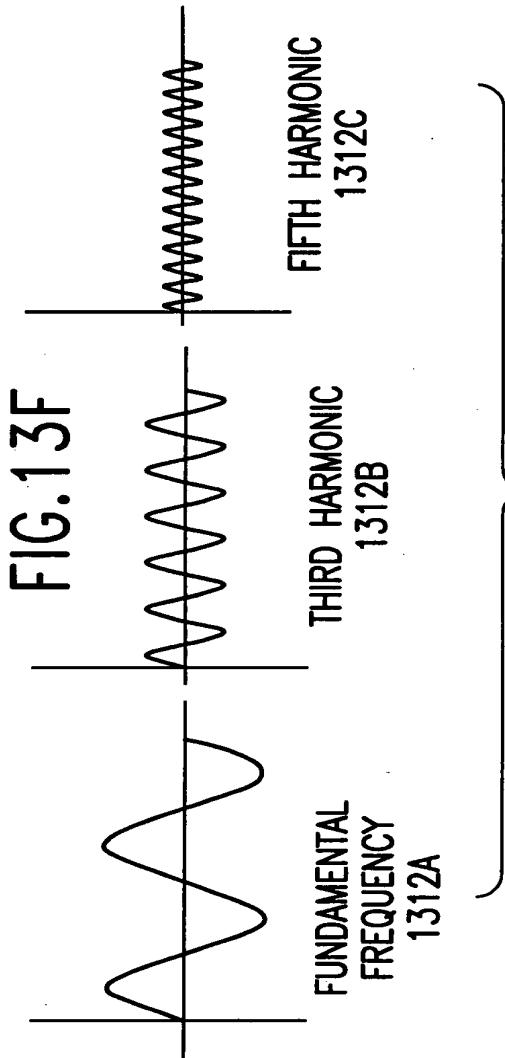


FIG. 13F

FIG. 13G

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
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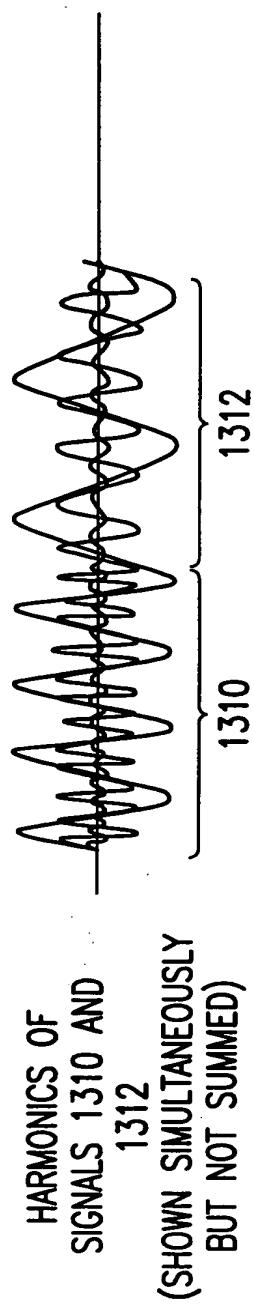


FIG. 13H

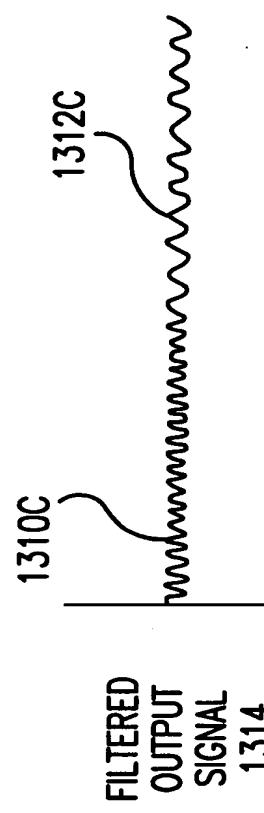


FIG. 13I

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Title: Apparatus, System, and Method for Down-Converting
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UNIFIED DOWNCONVERTING AND
FILTERING (UDF) MODULE 1402

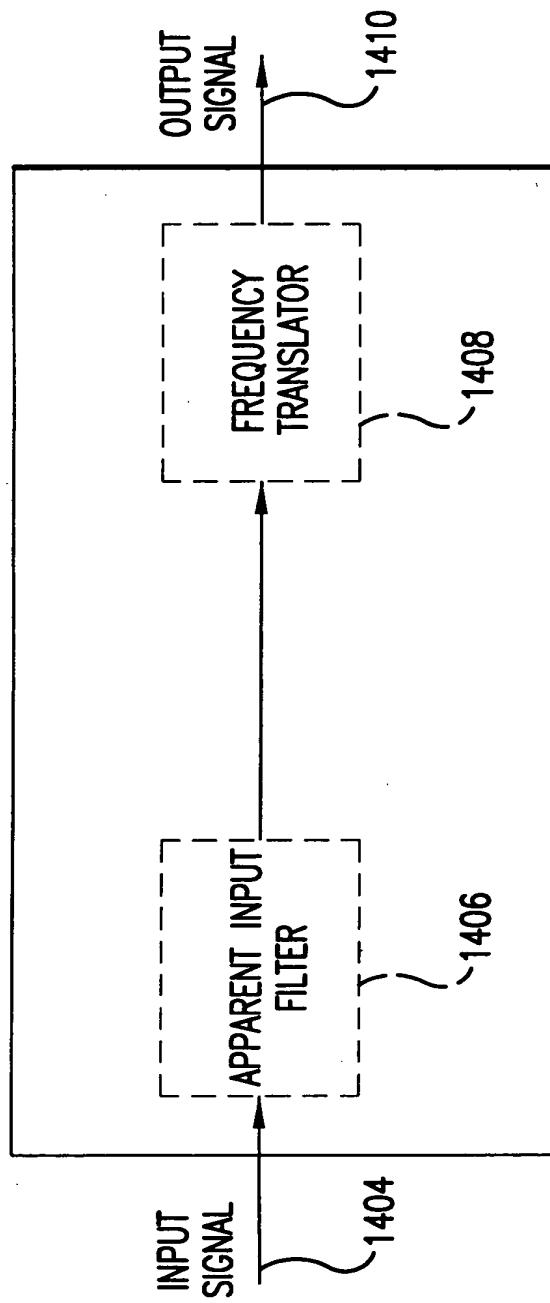


FIG. 14

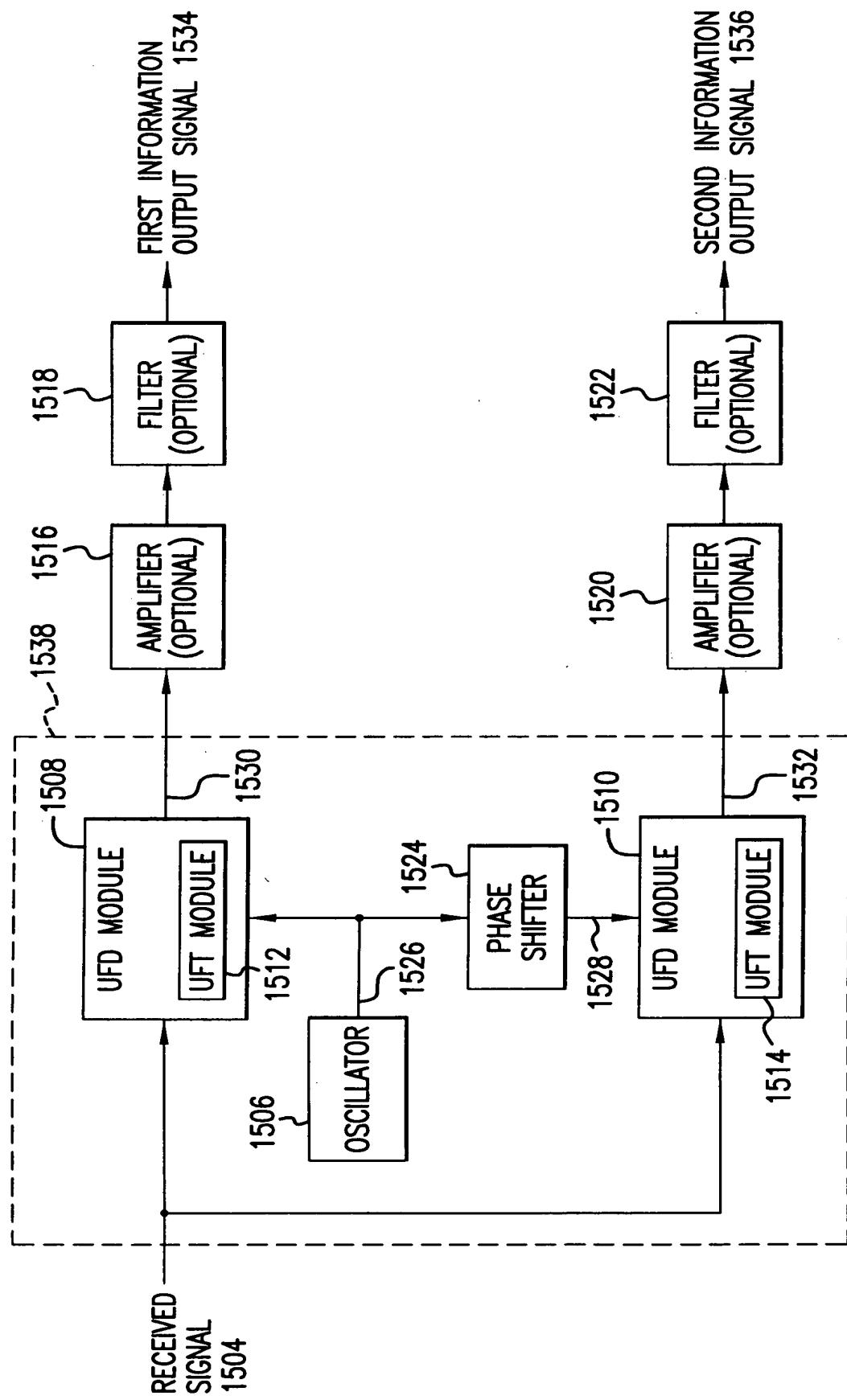


FIG. 15

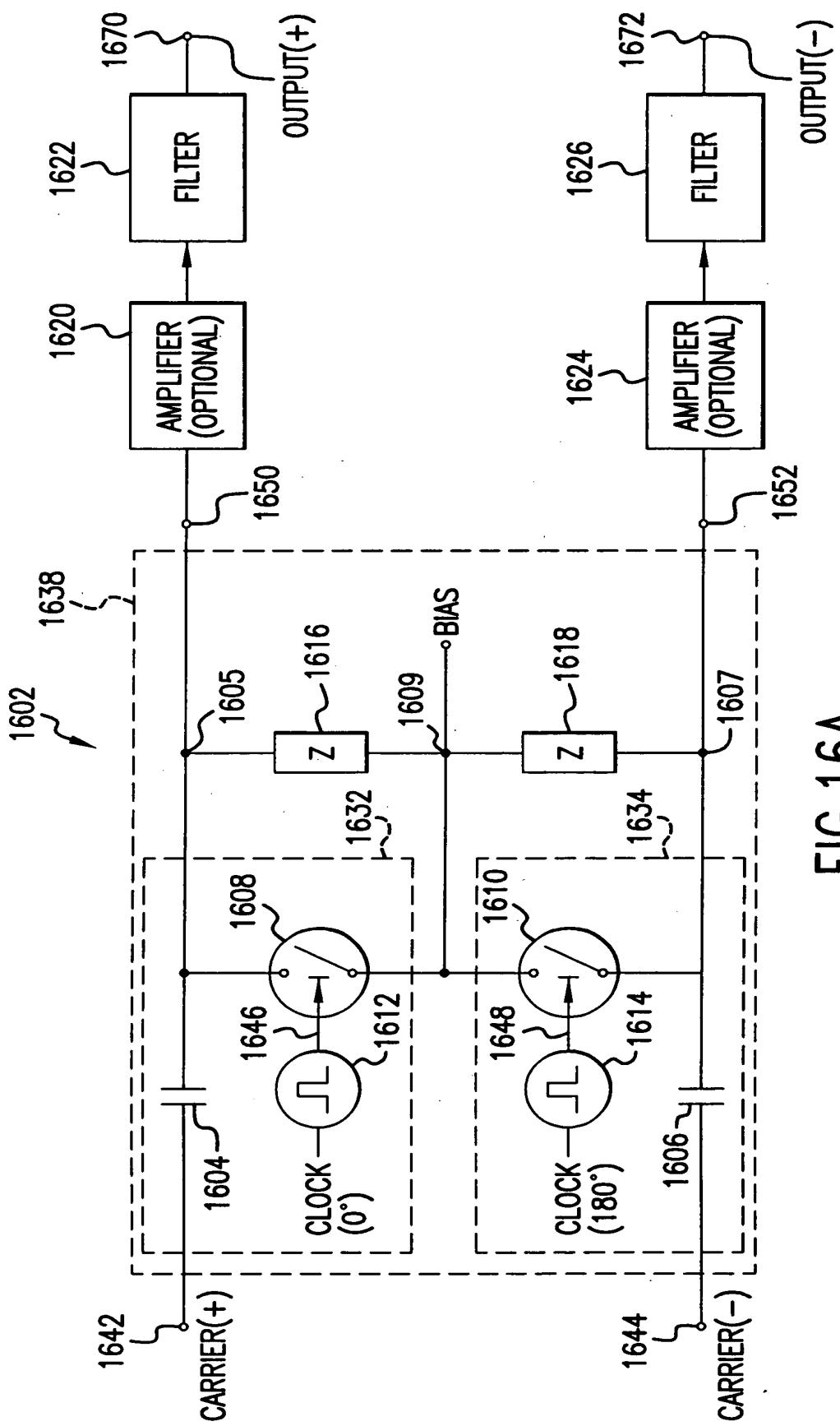


FIG. 16A

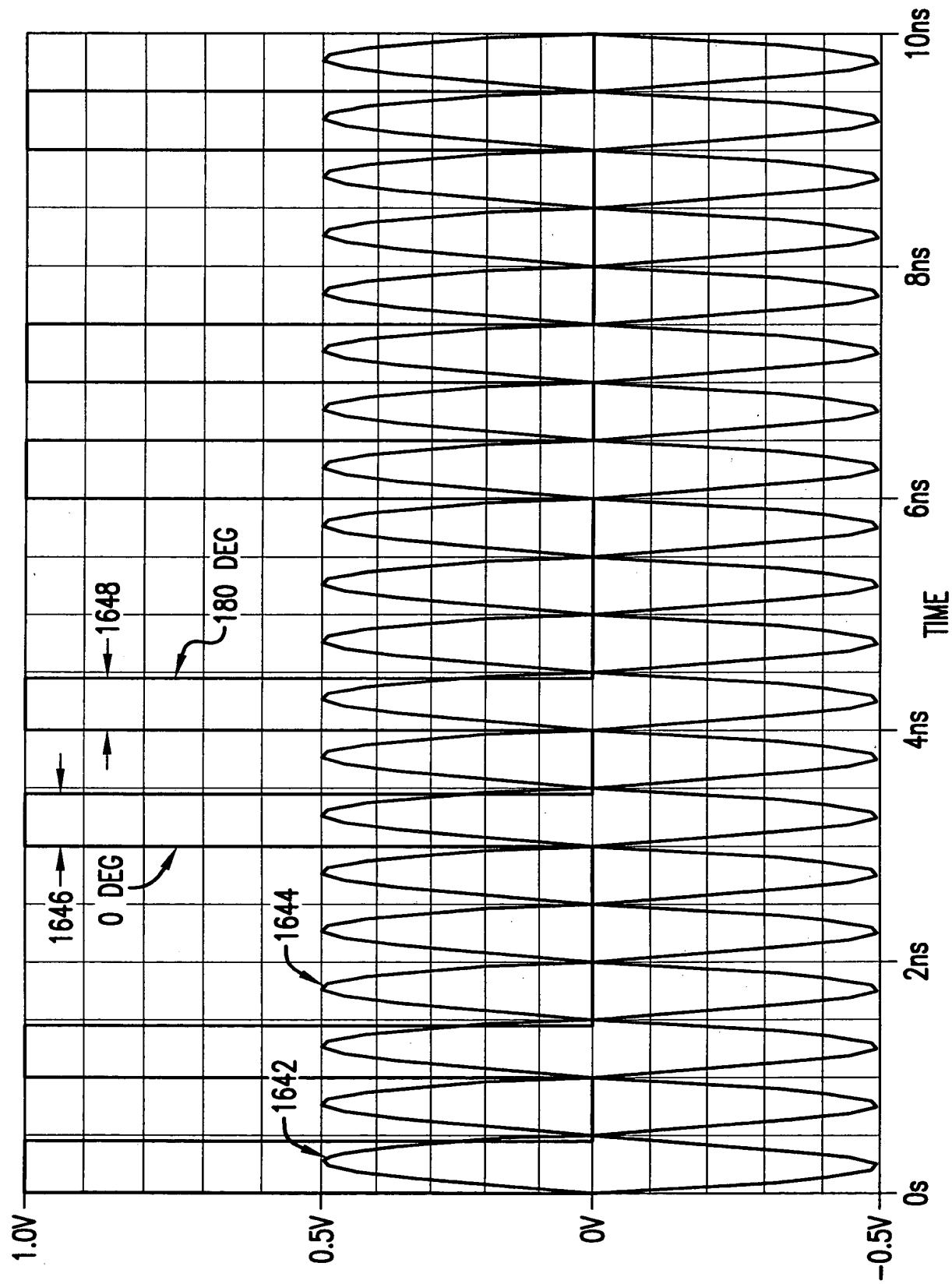


FIG. 16B

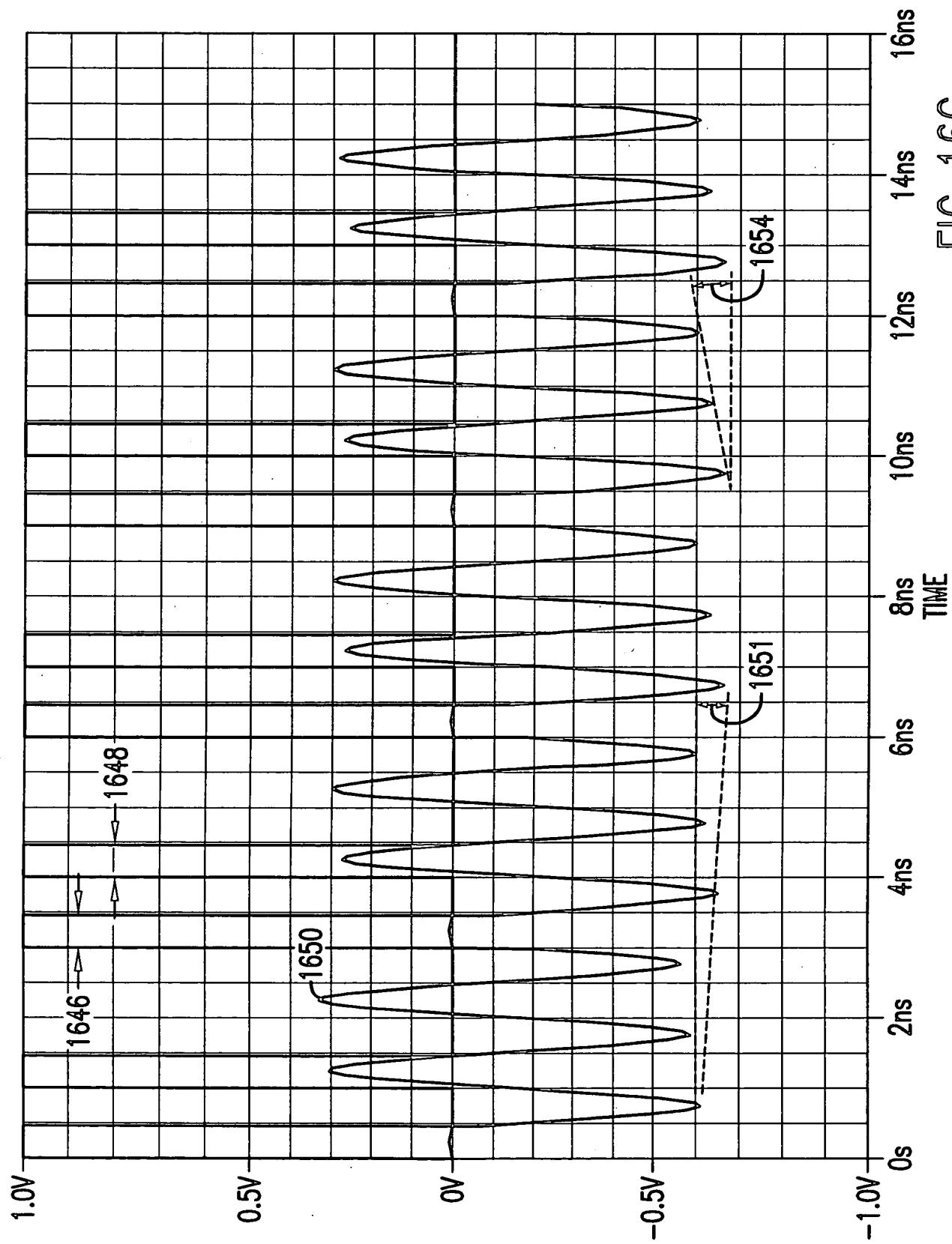


FIG. 16C

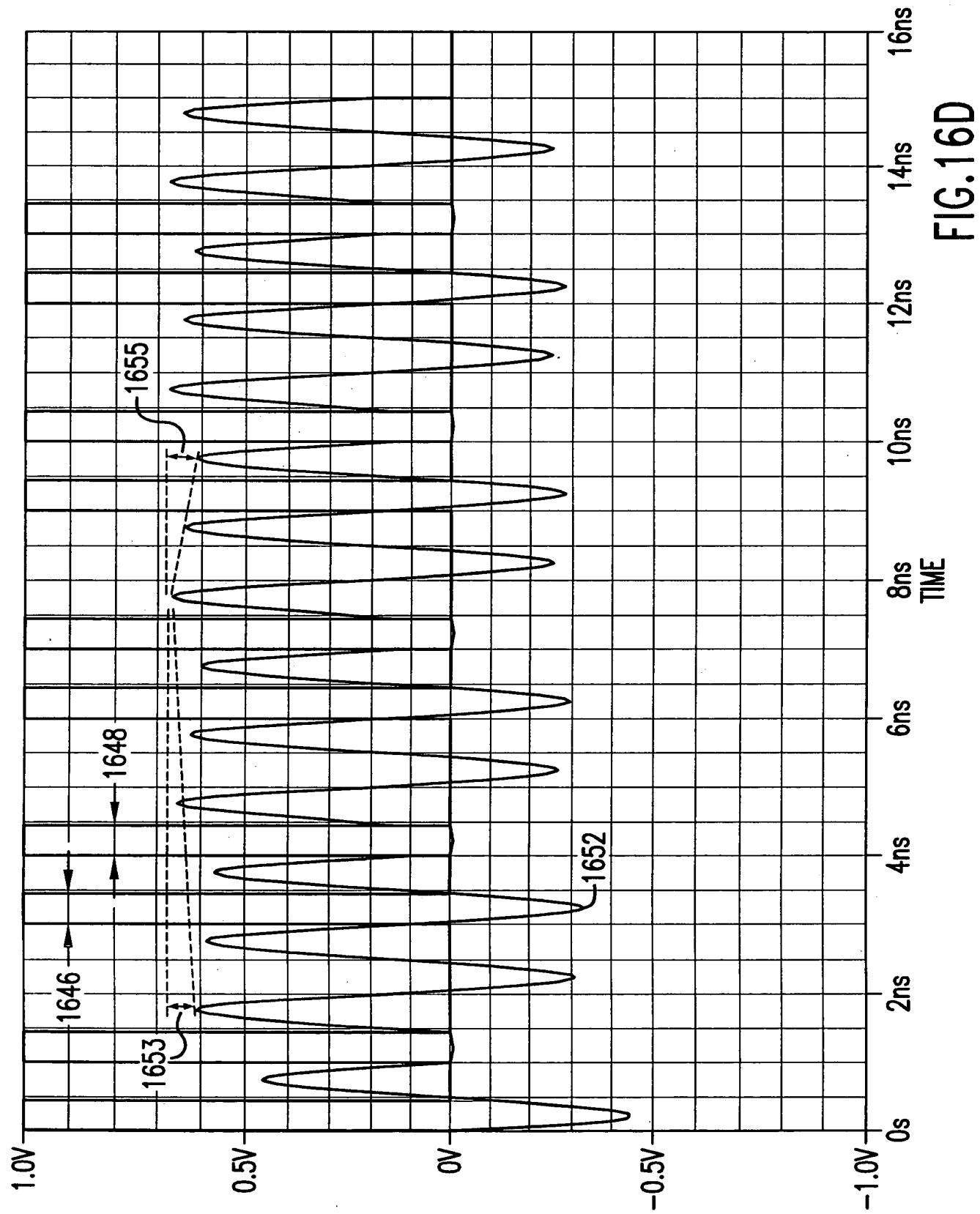
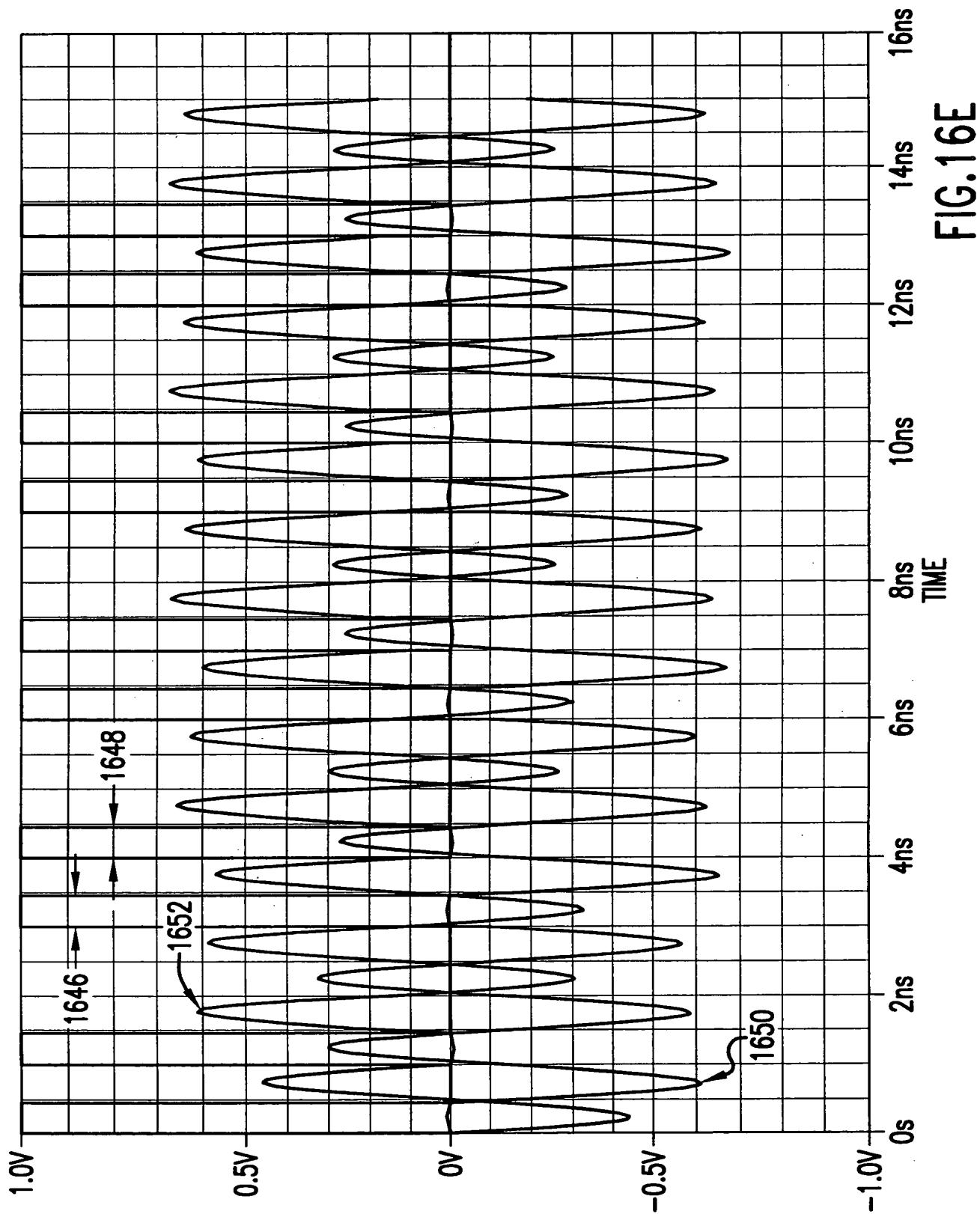


FIG. 16D



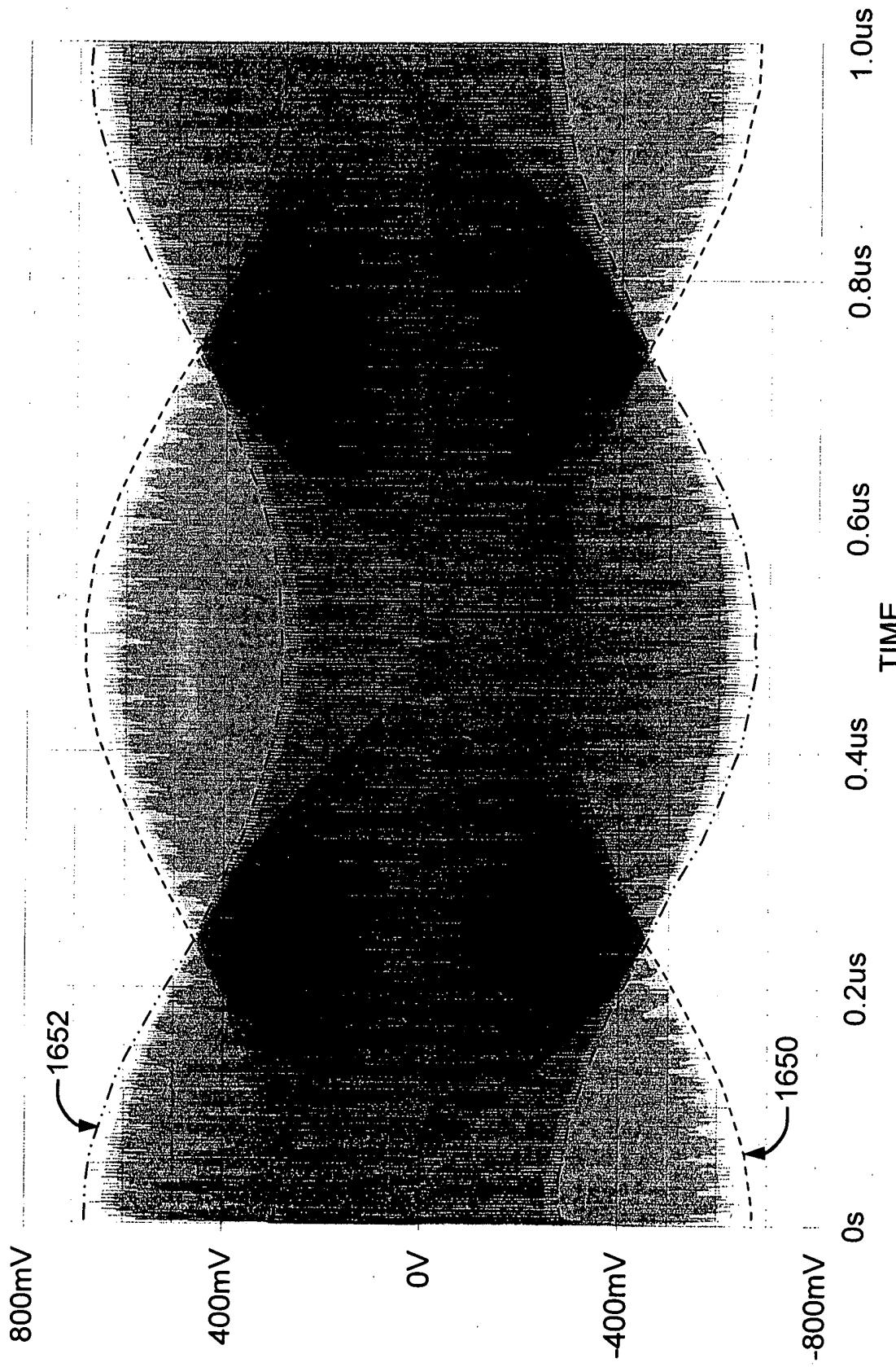


FIG. 16F

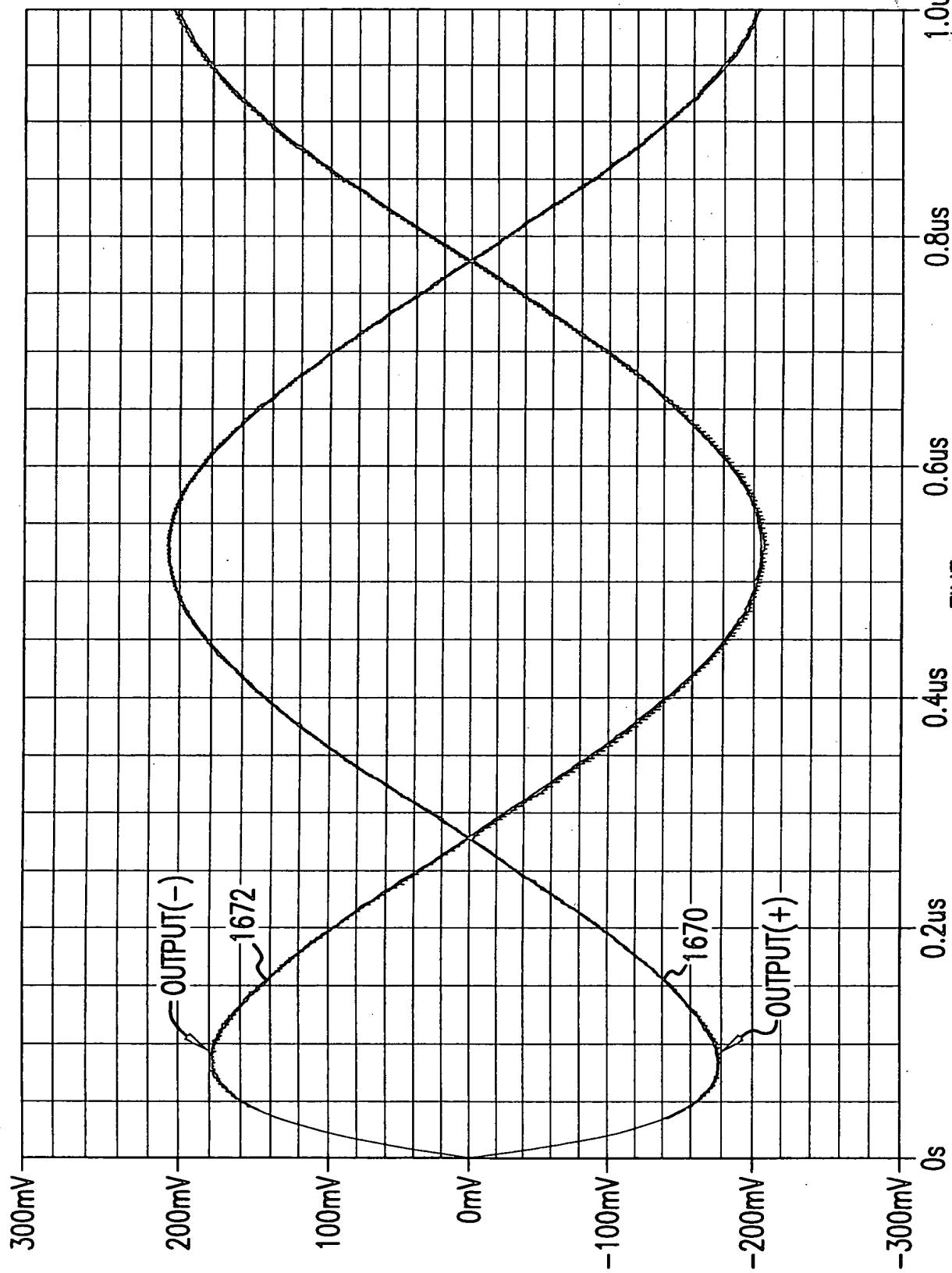


FIG. 16G

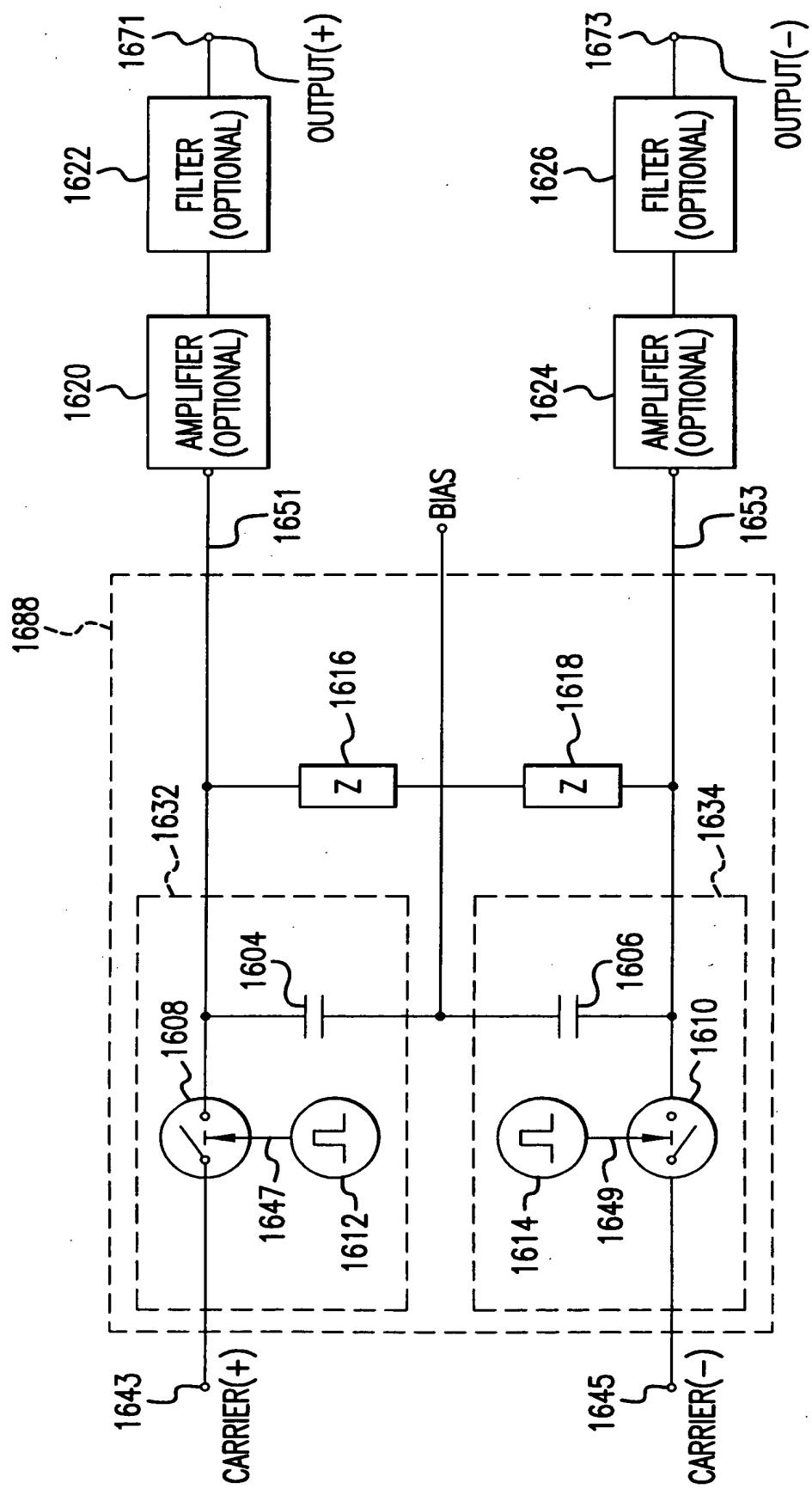
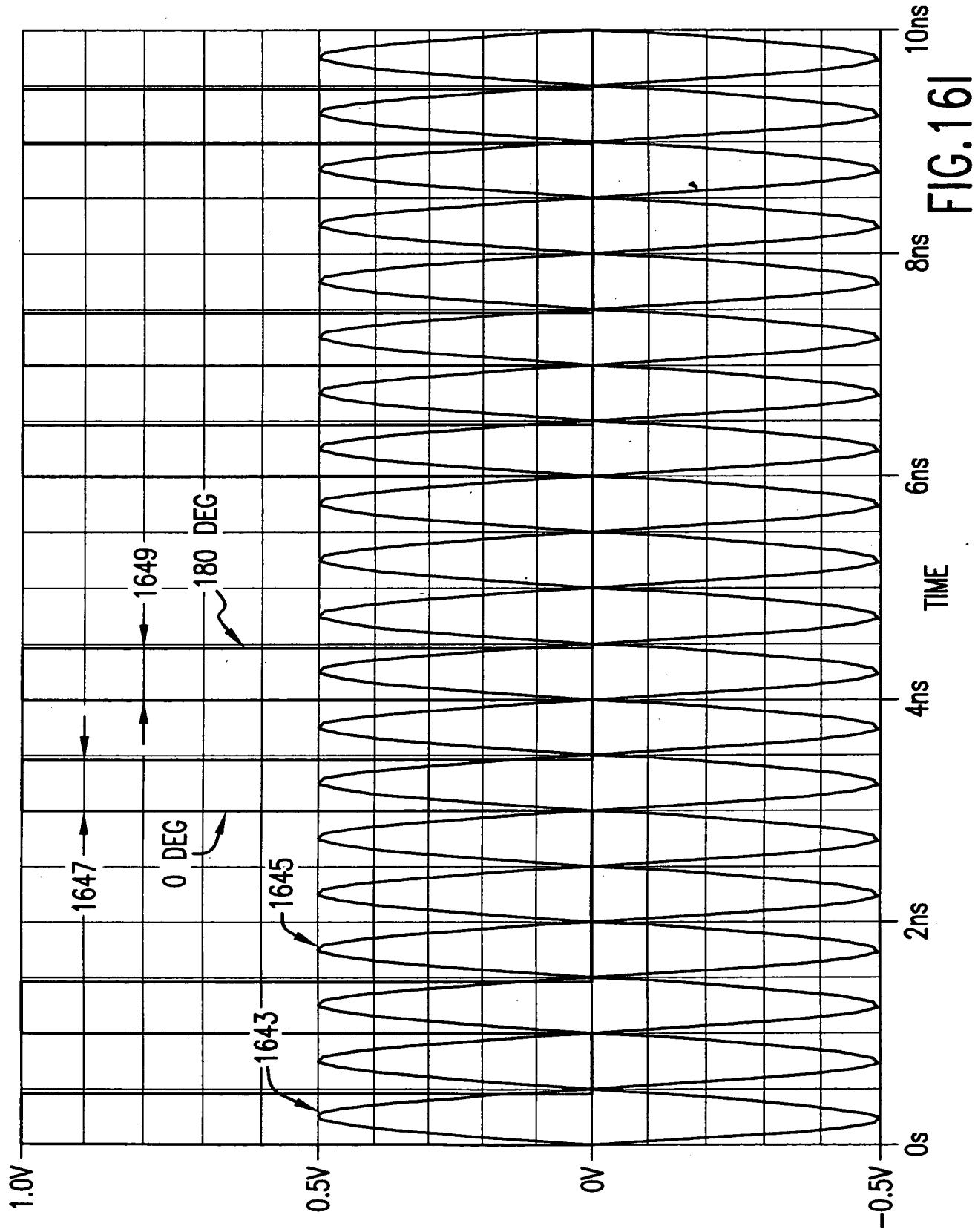


FIG. 16H



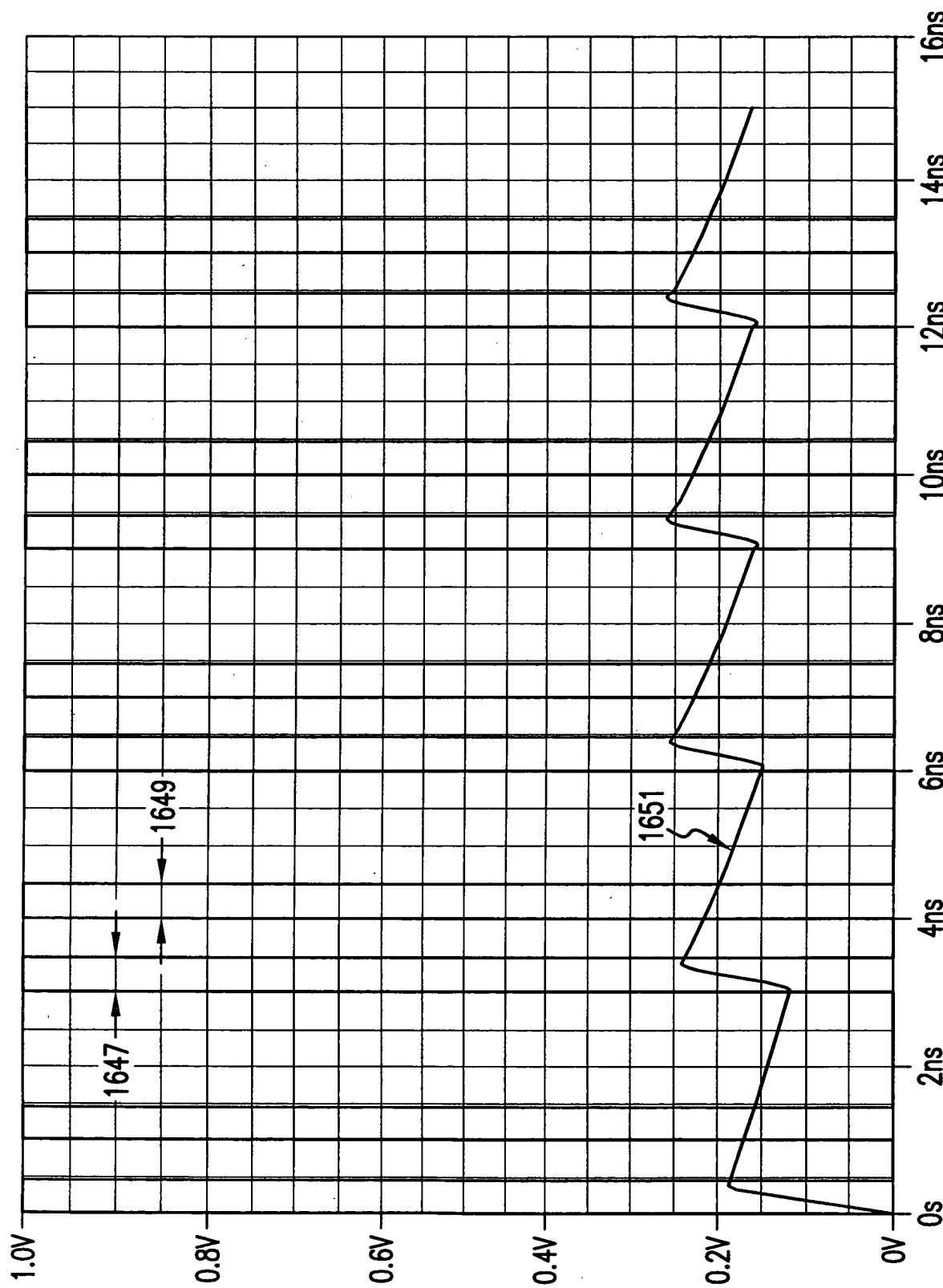


FIG. 16J

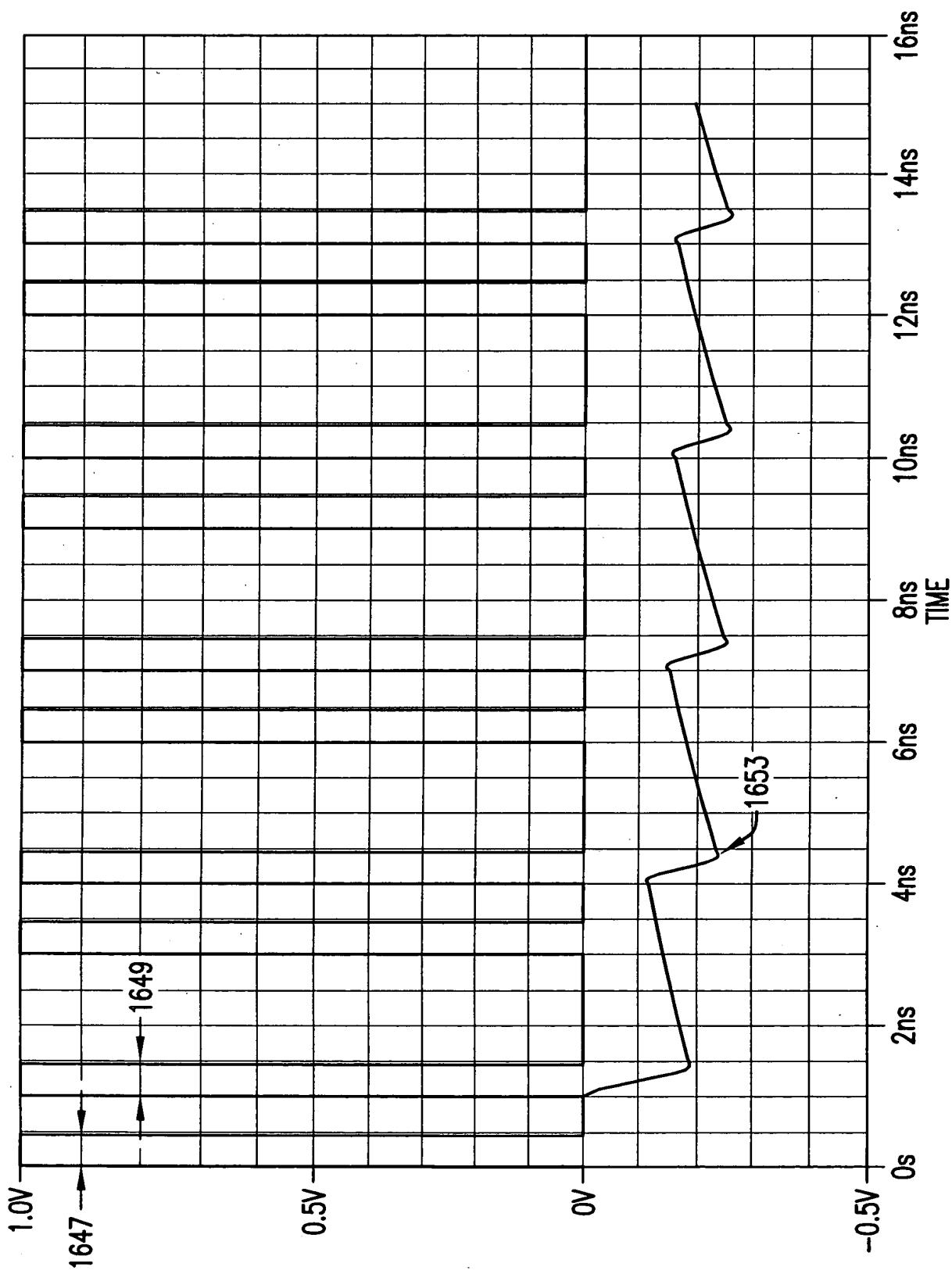


FIG. 16K

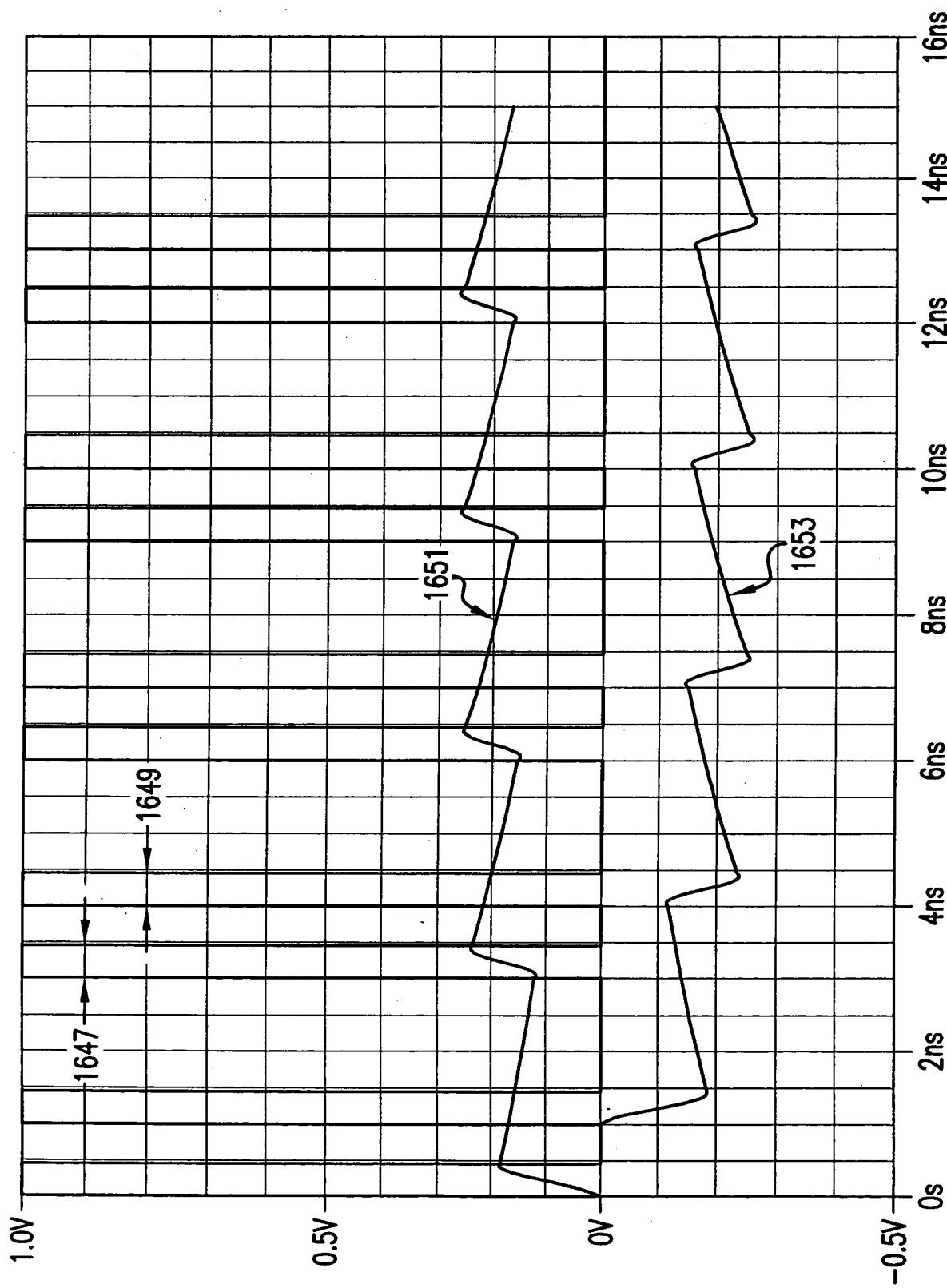


FIG. 16L

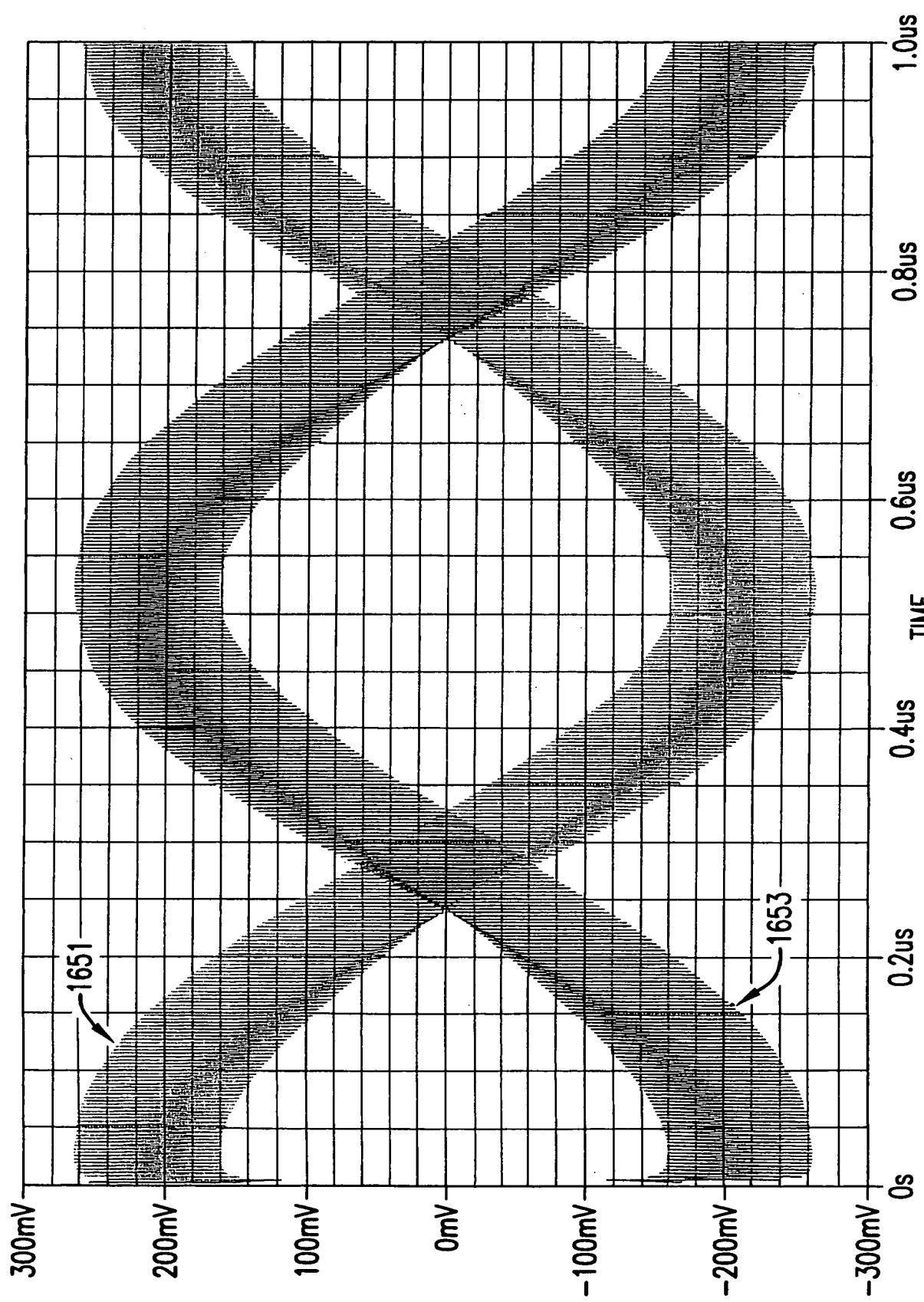


FIG. 16M

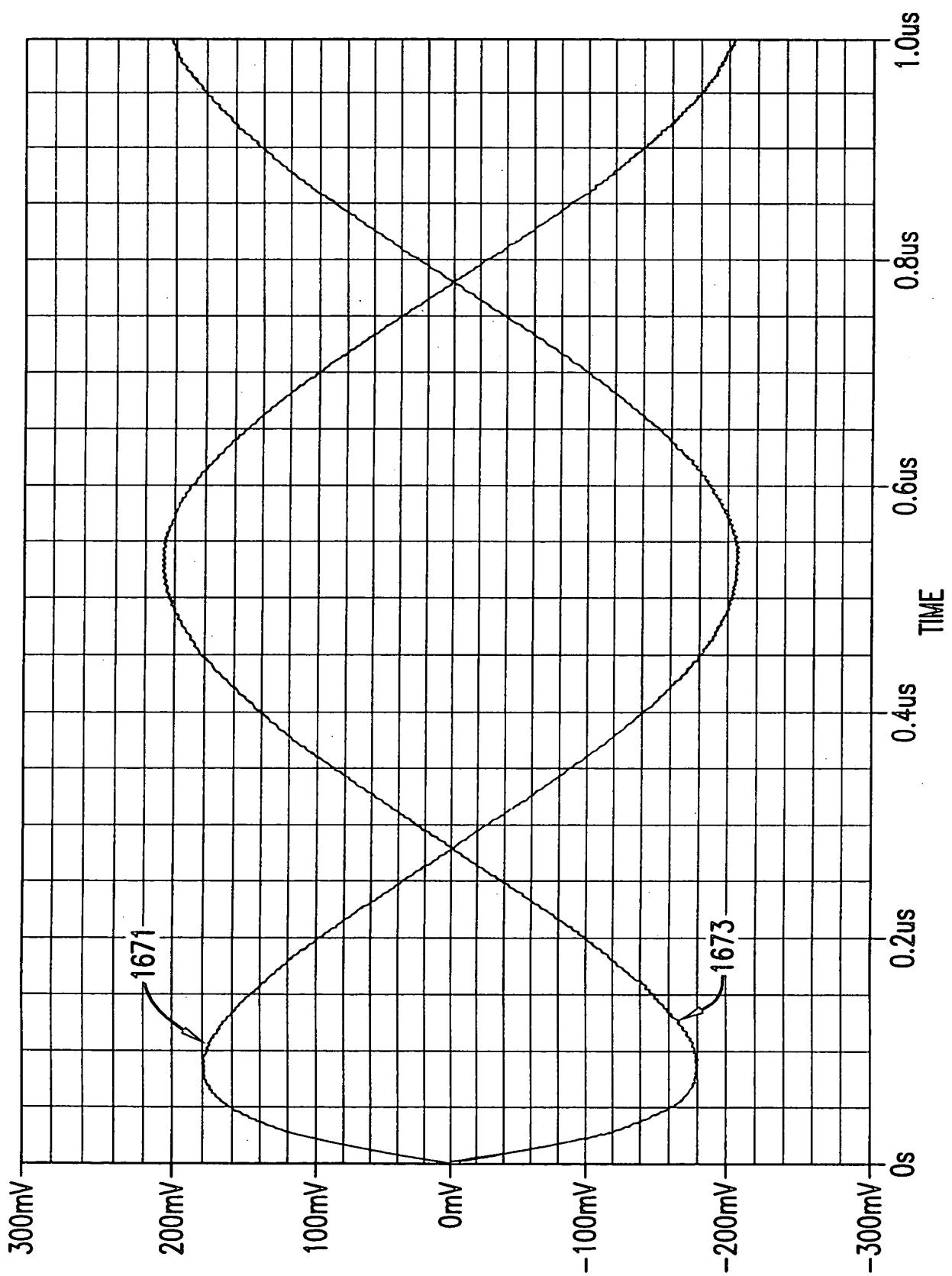


FIG. 16N

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrelles *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

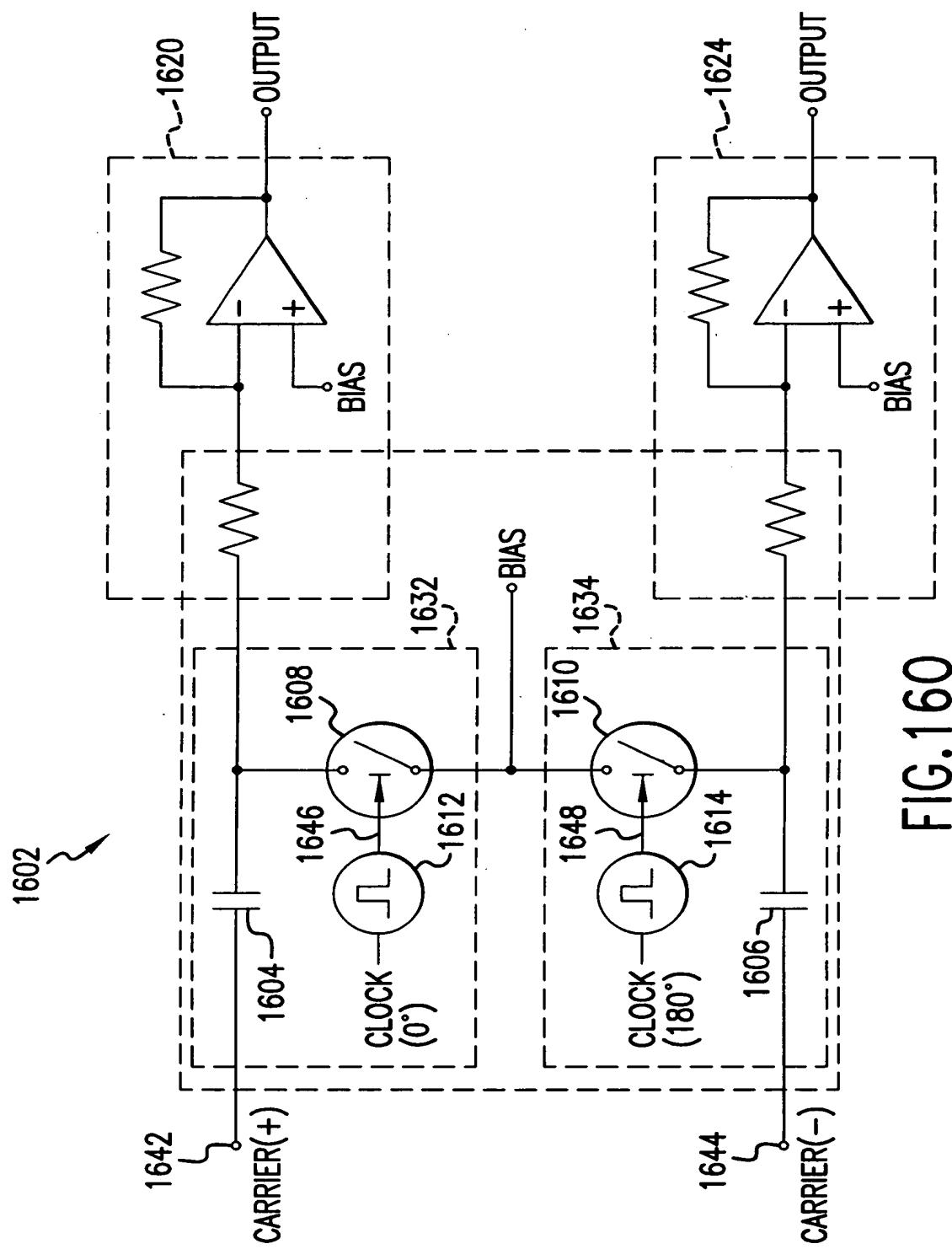


FIG. 160

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorreels *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

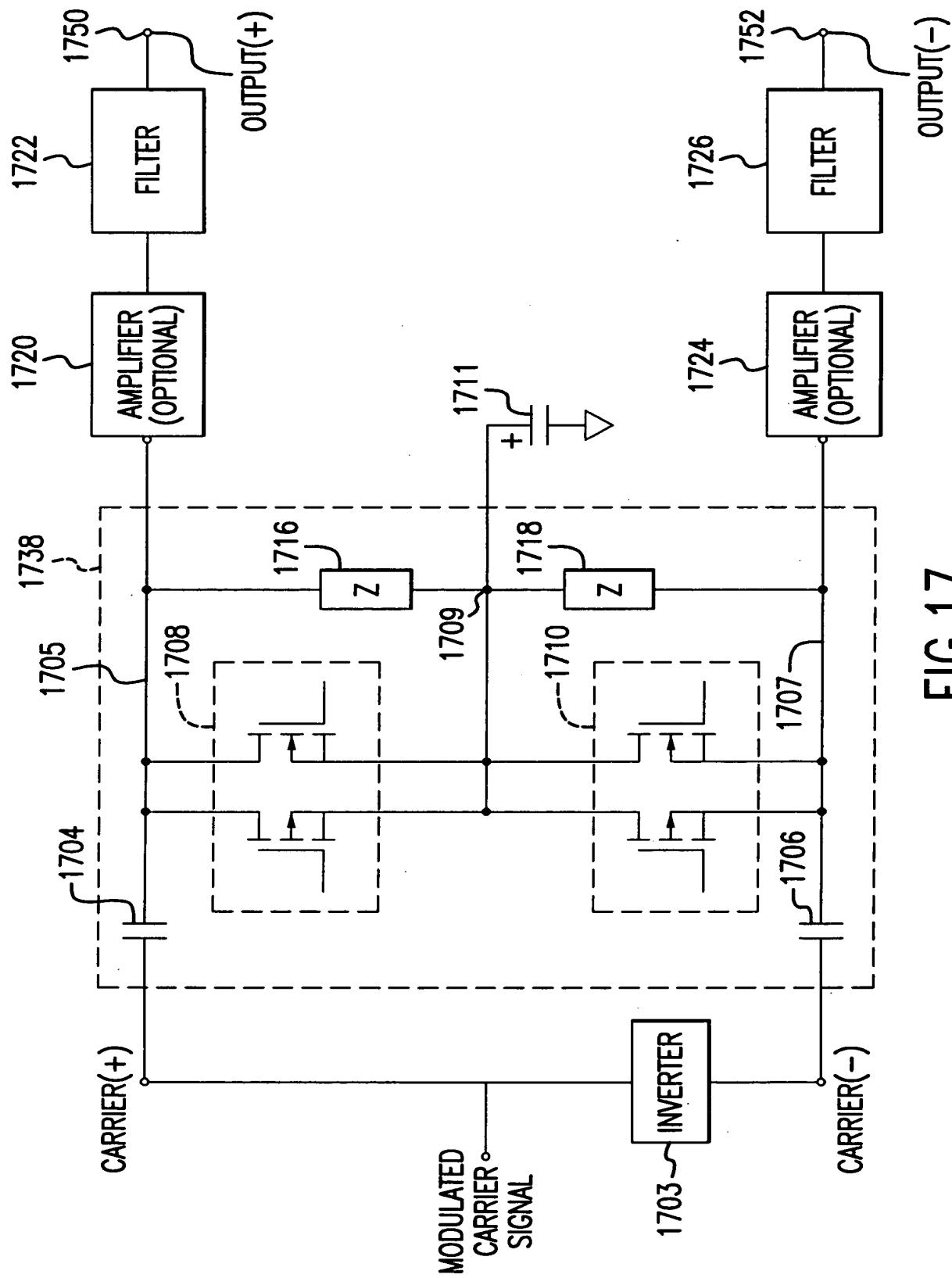


FIG. 17

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorreels *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
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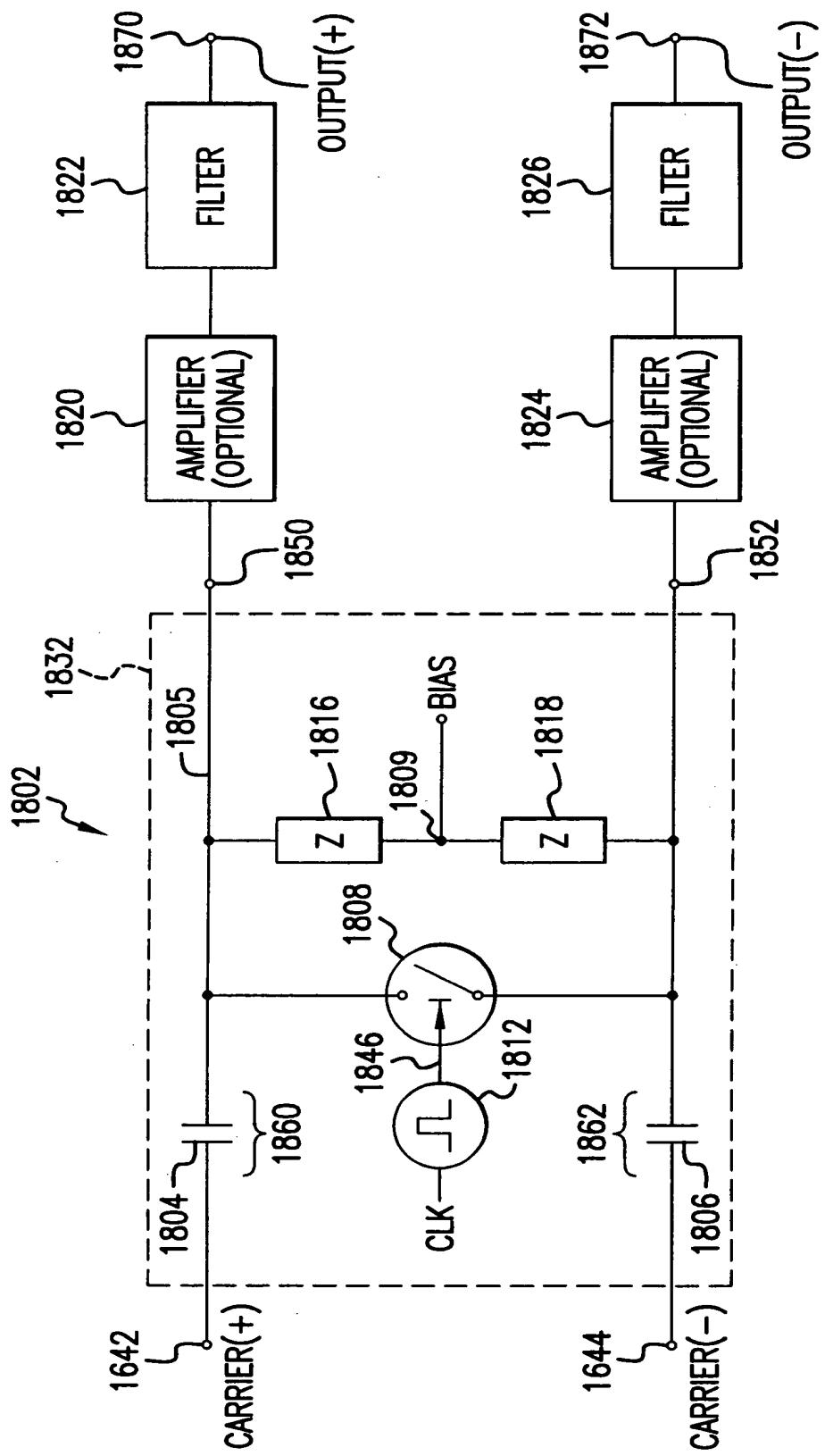


FIG. 18A

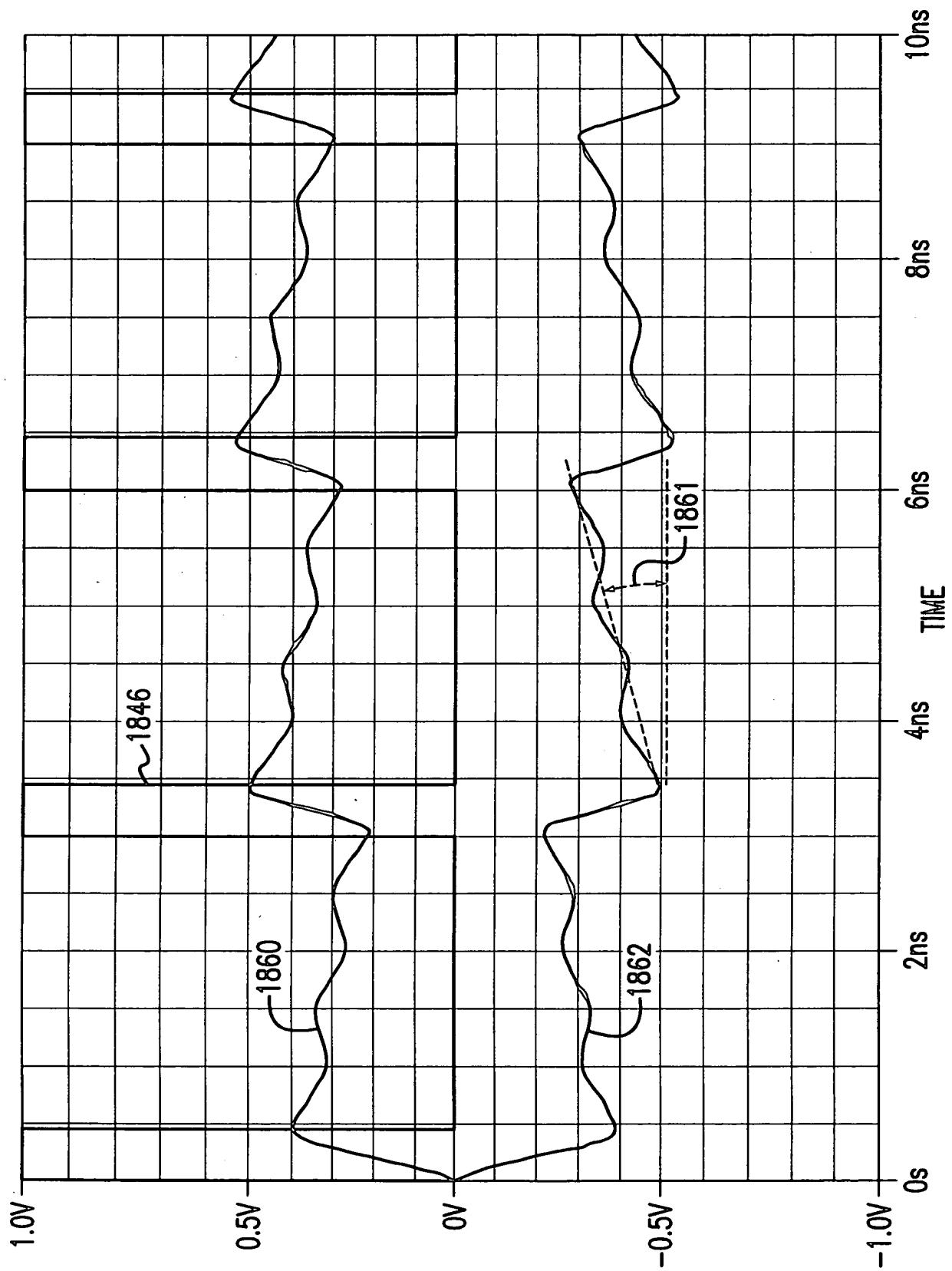
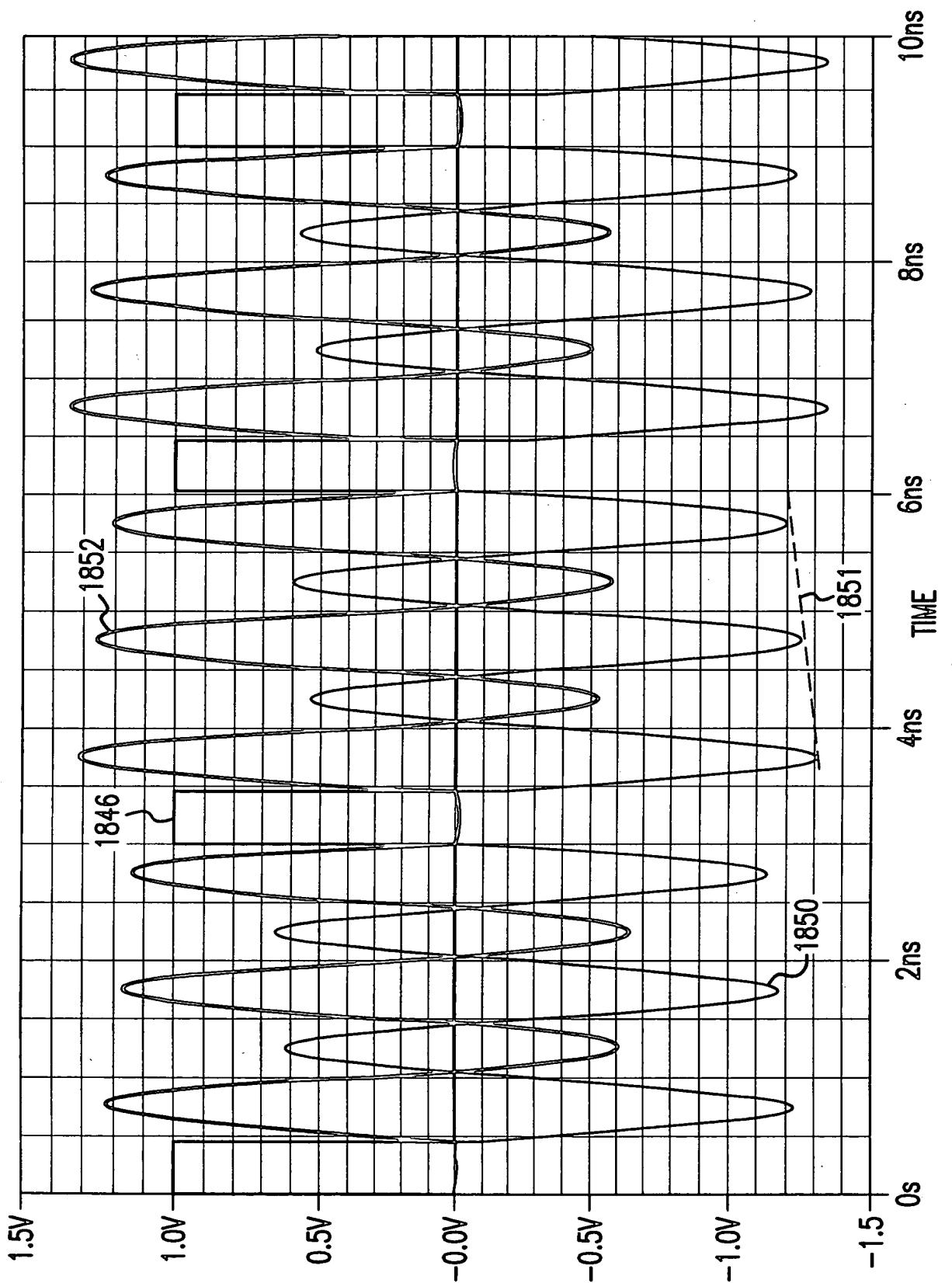


FIG. 18B



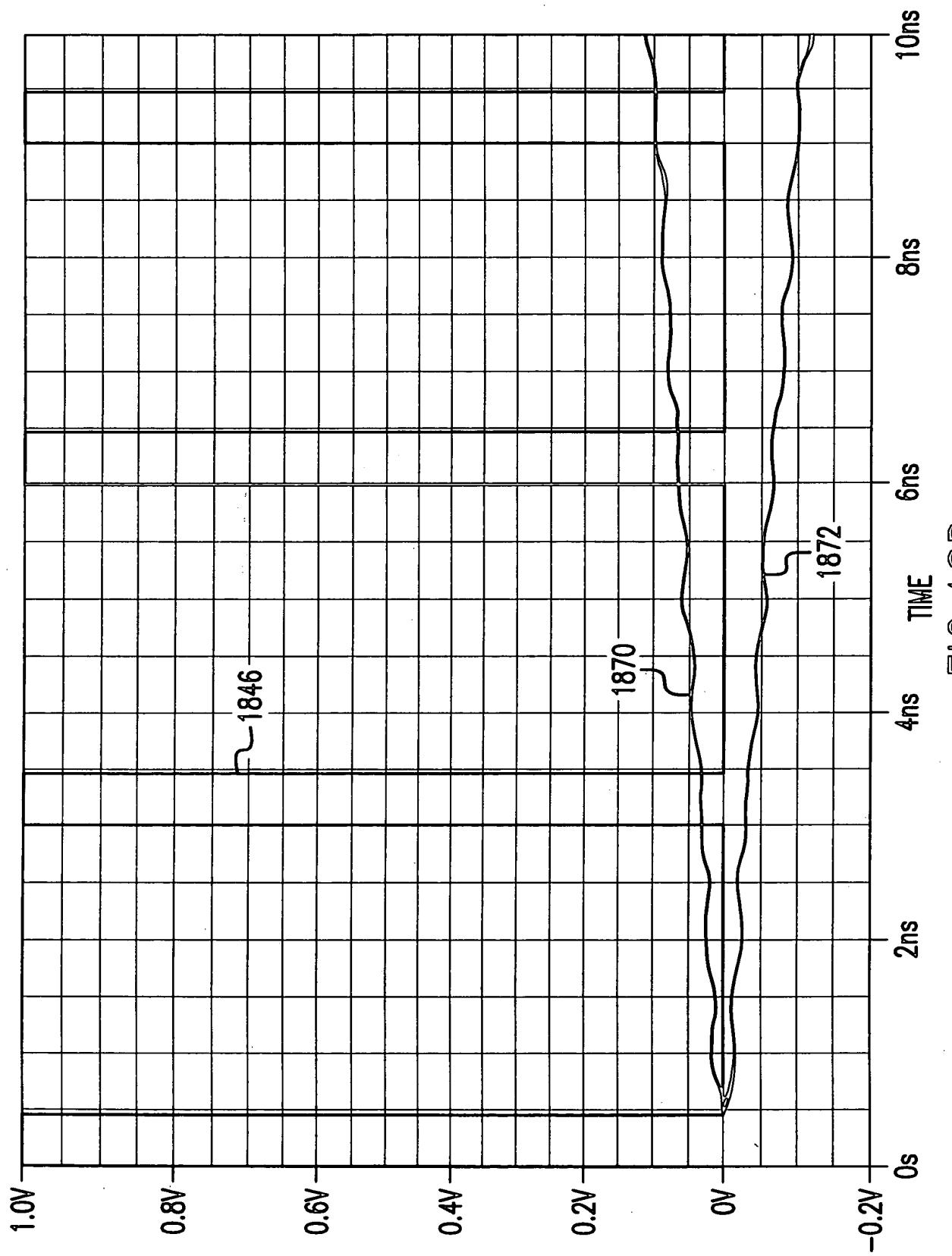
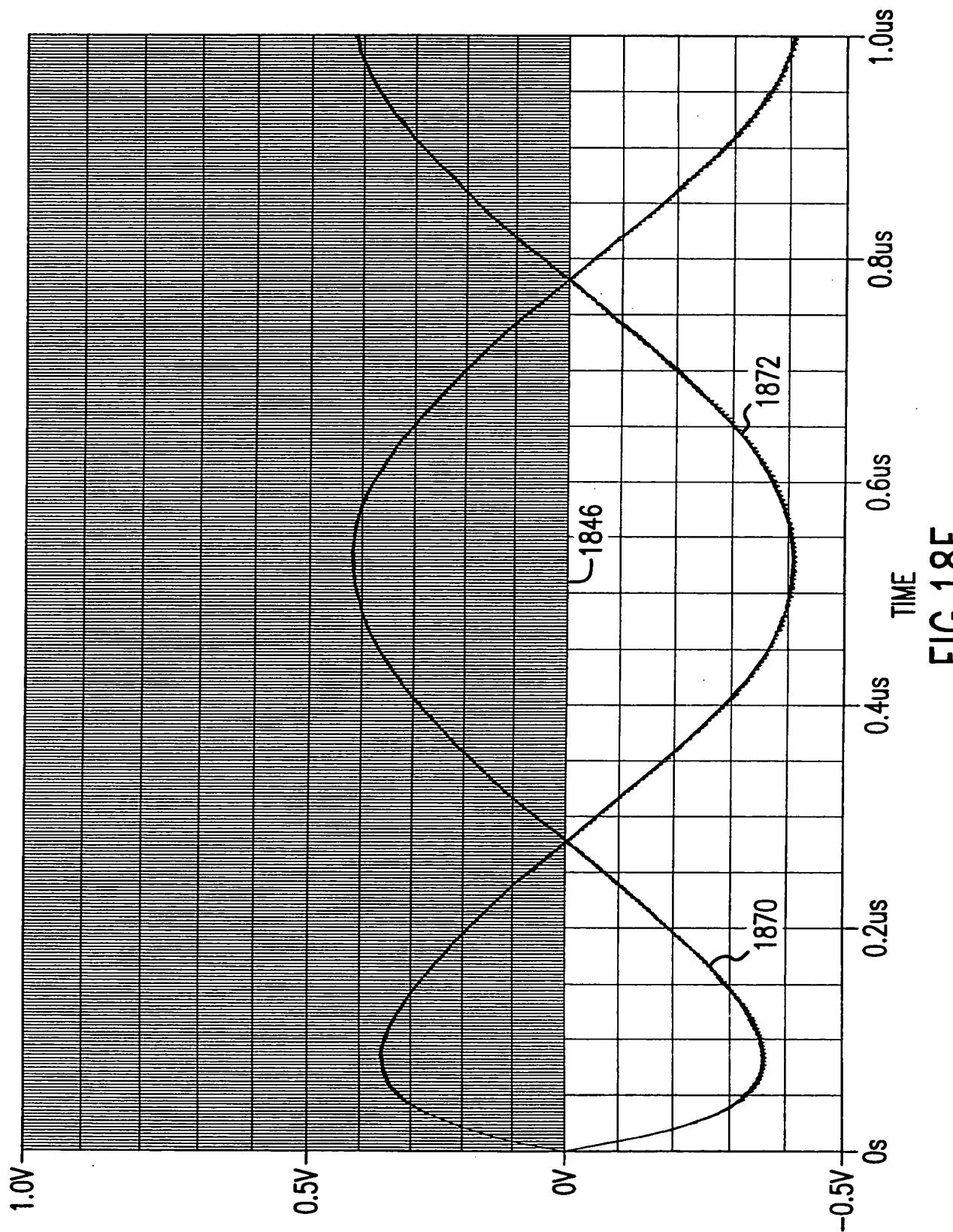
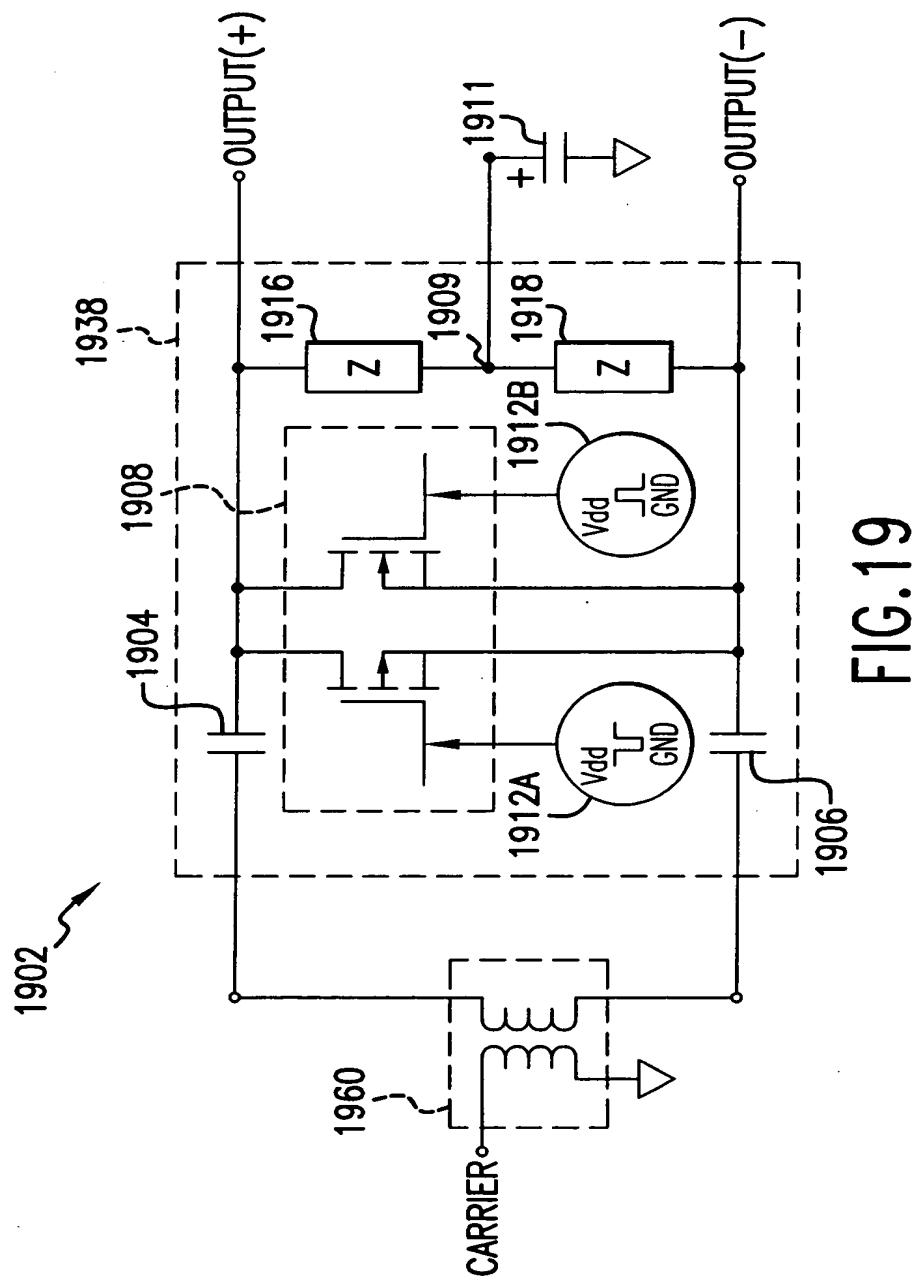


FIG. 18D





Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

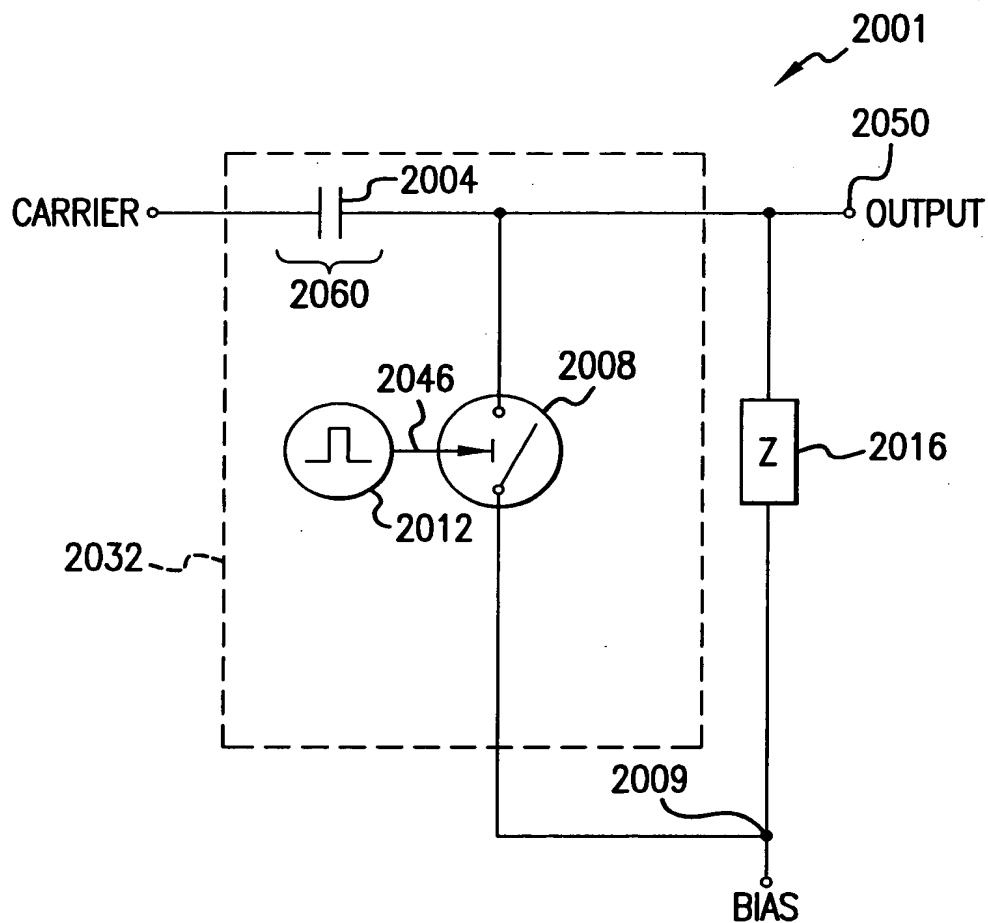


FIG.20A

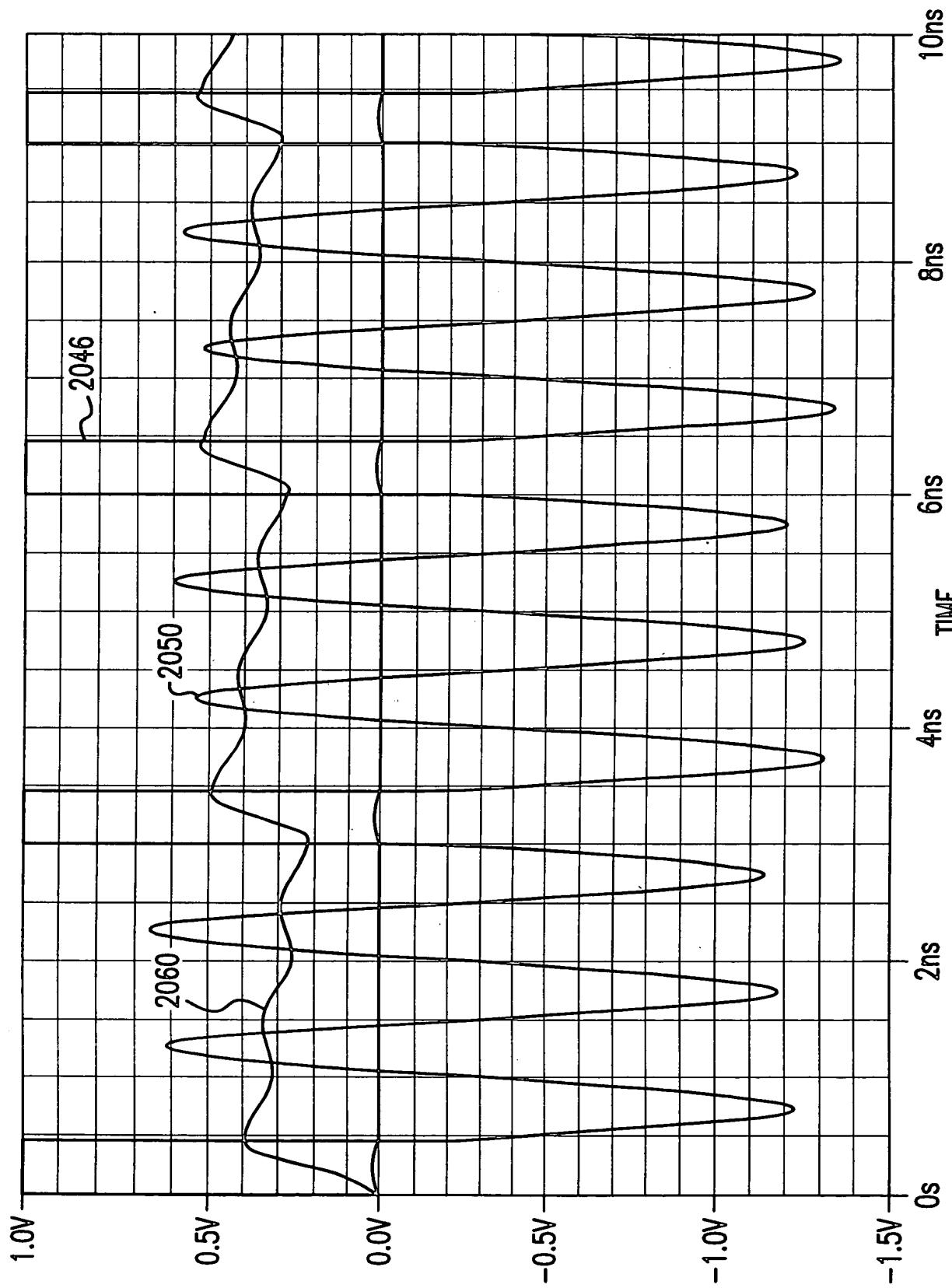


FIG. 20B

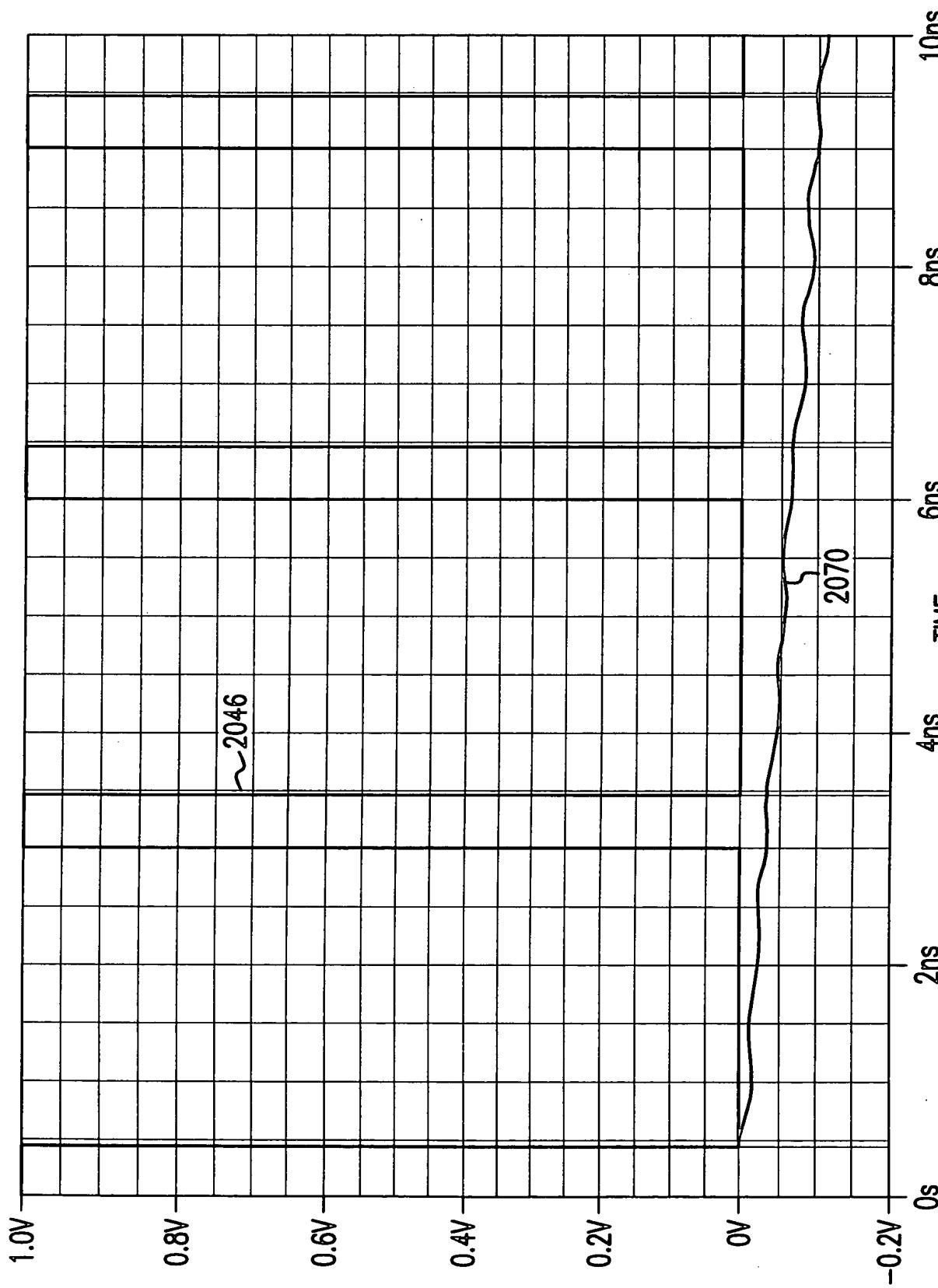
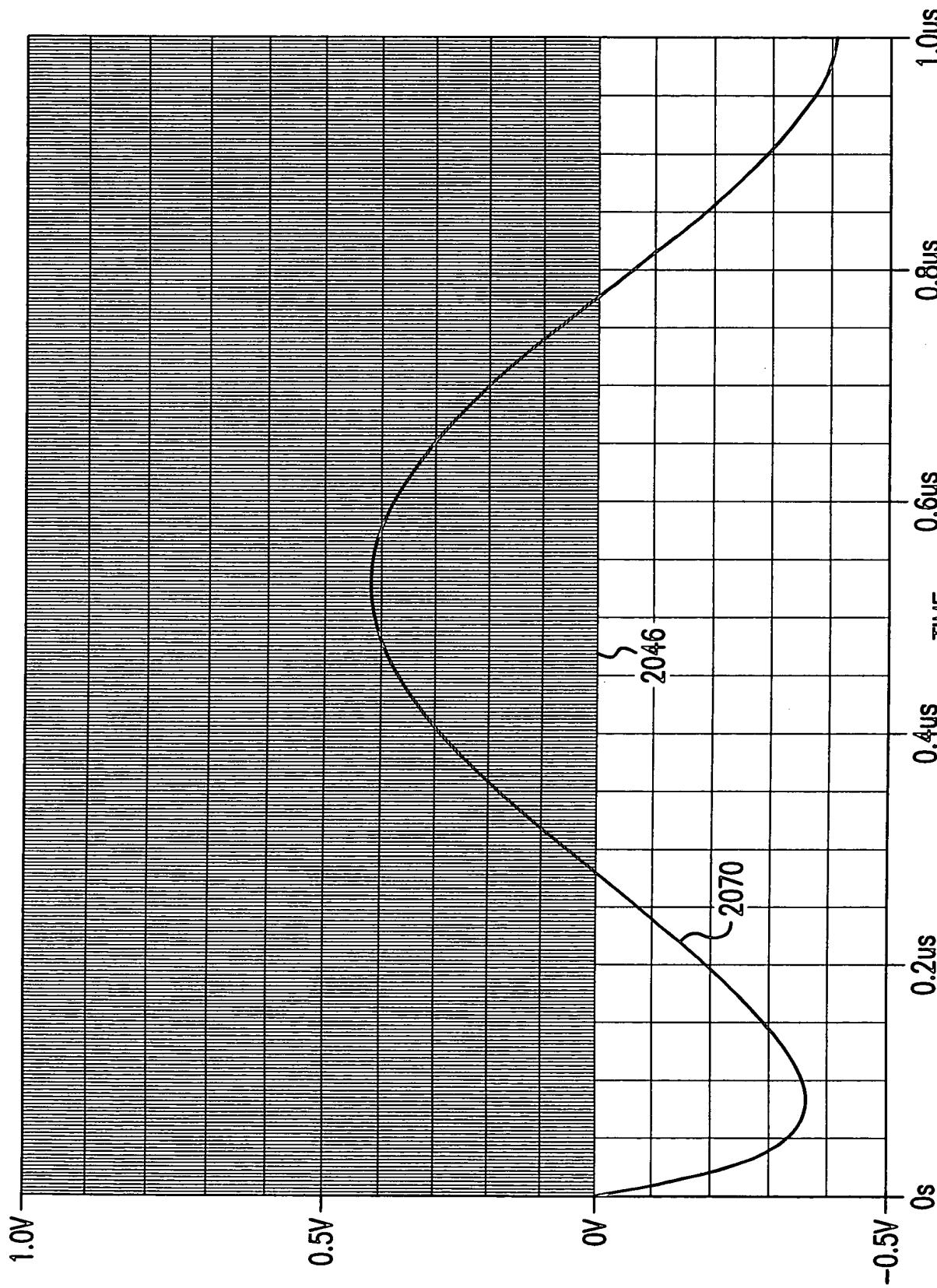
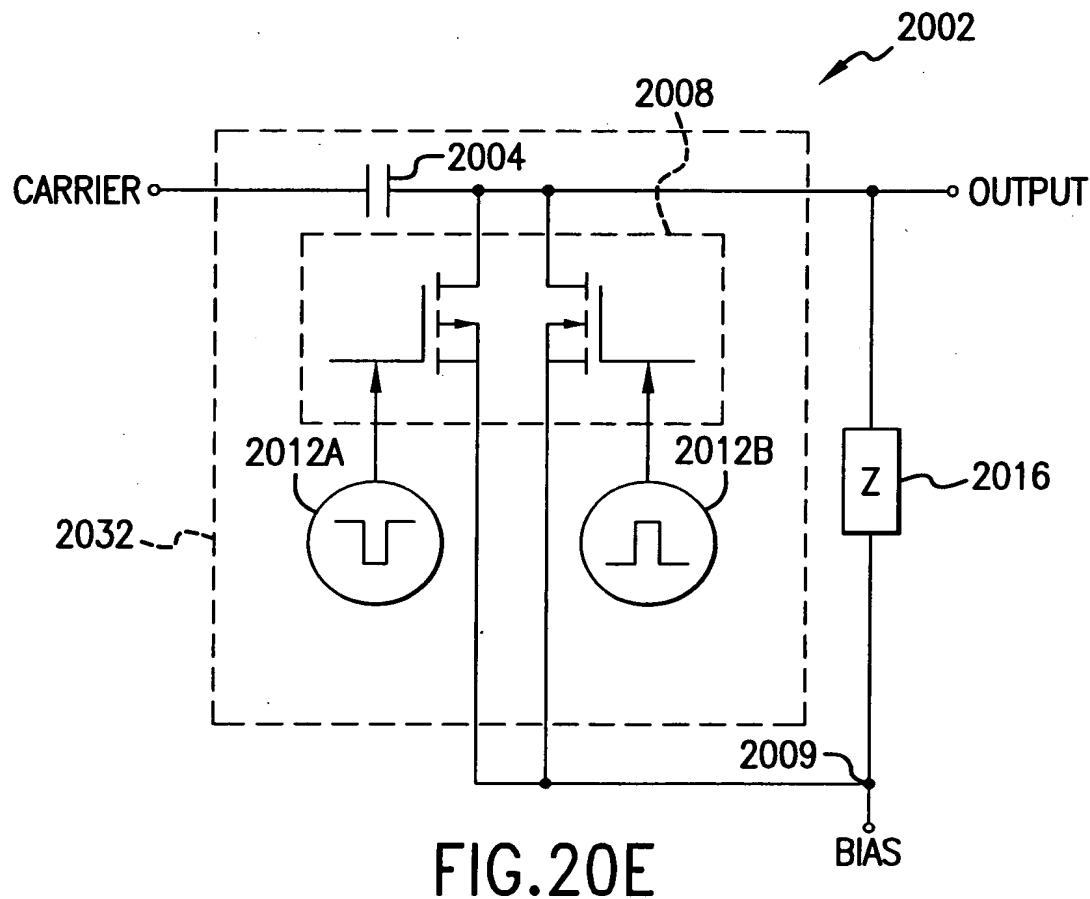
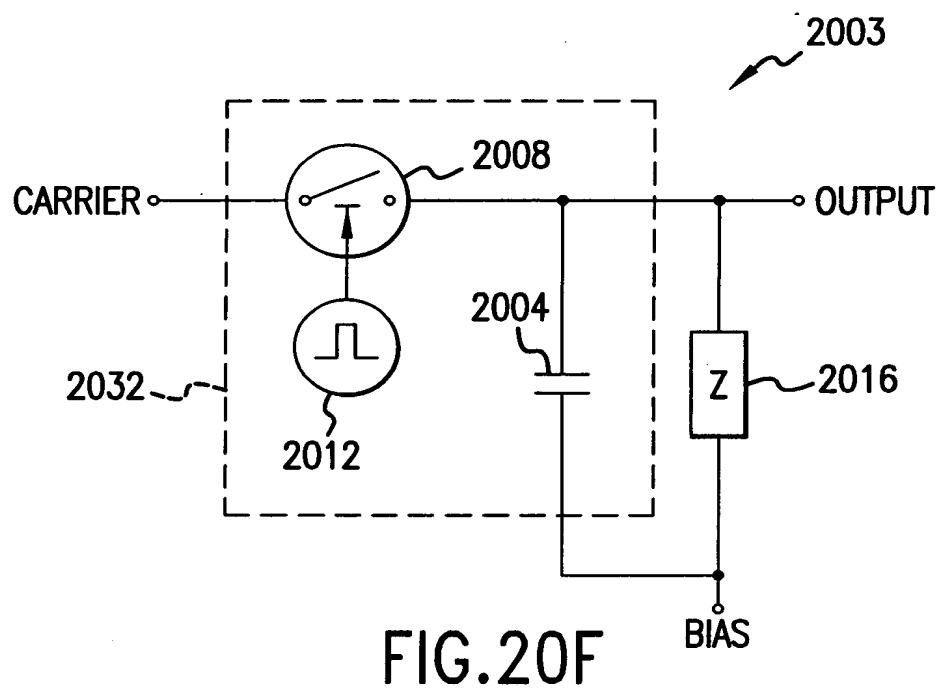


FIG. 20C







Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrelles *et al.*; Tel: 202/371-2600
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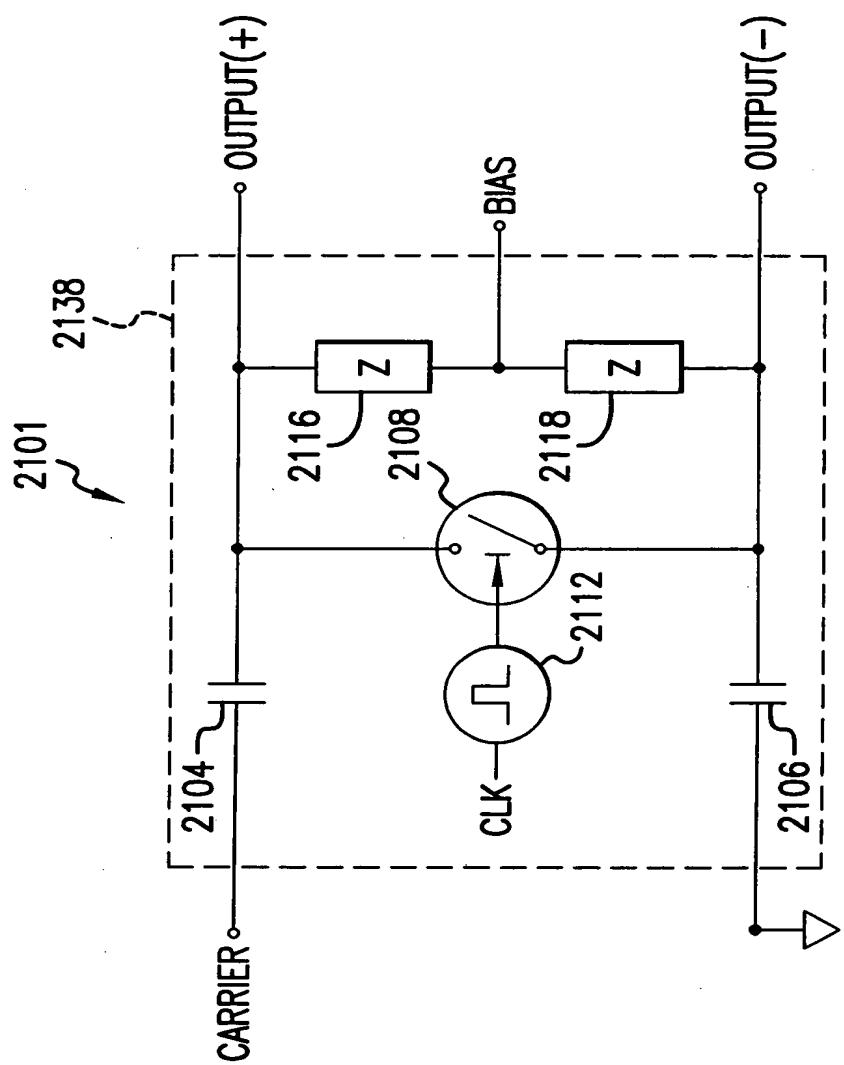


FIG. 21

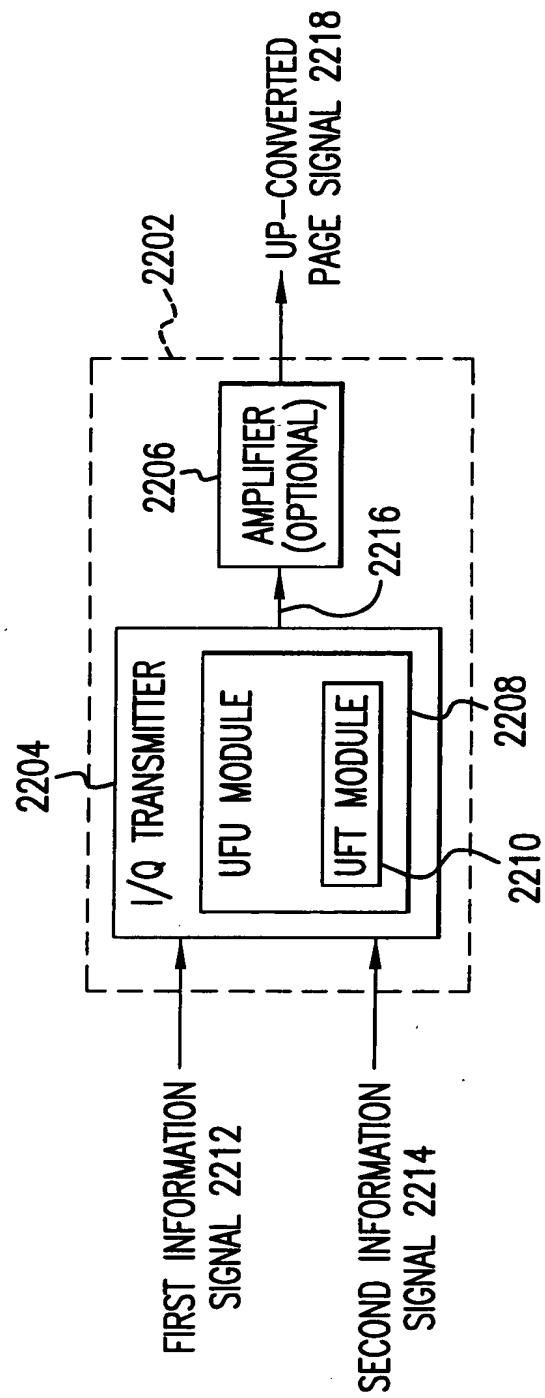


FIG. 22

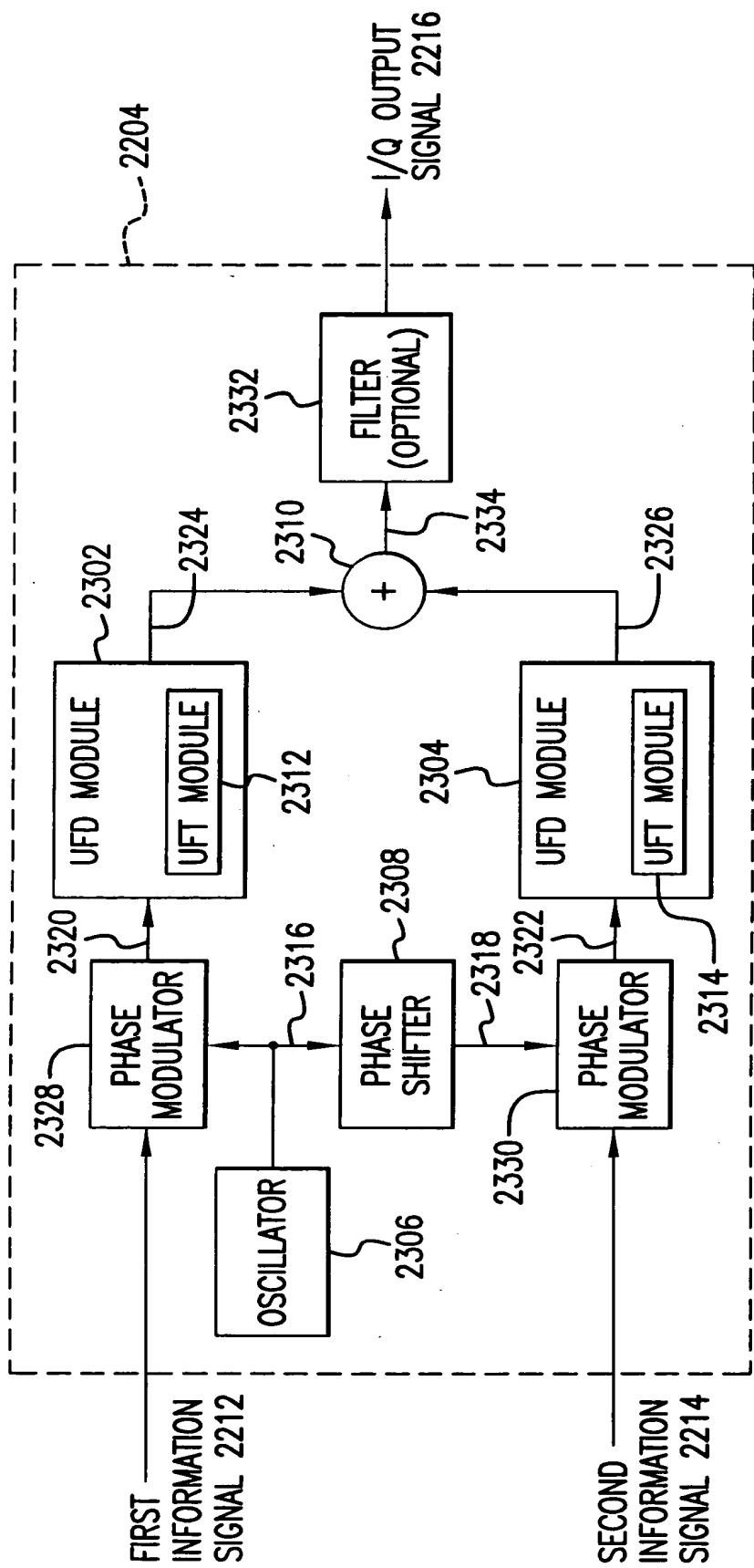


FIG. 23

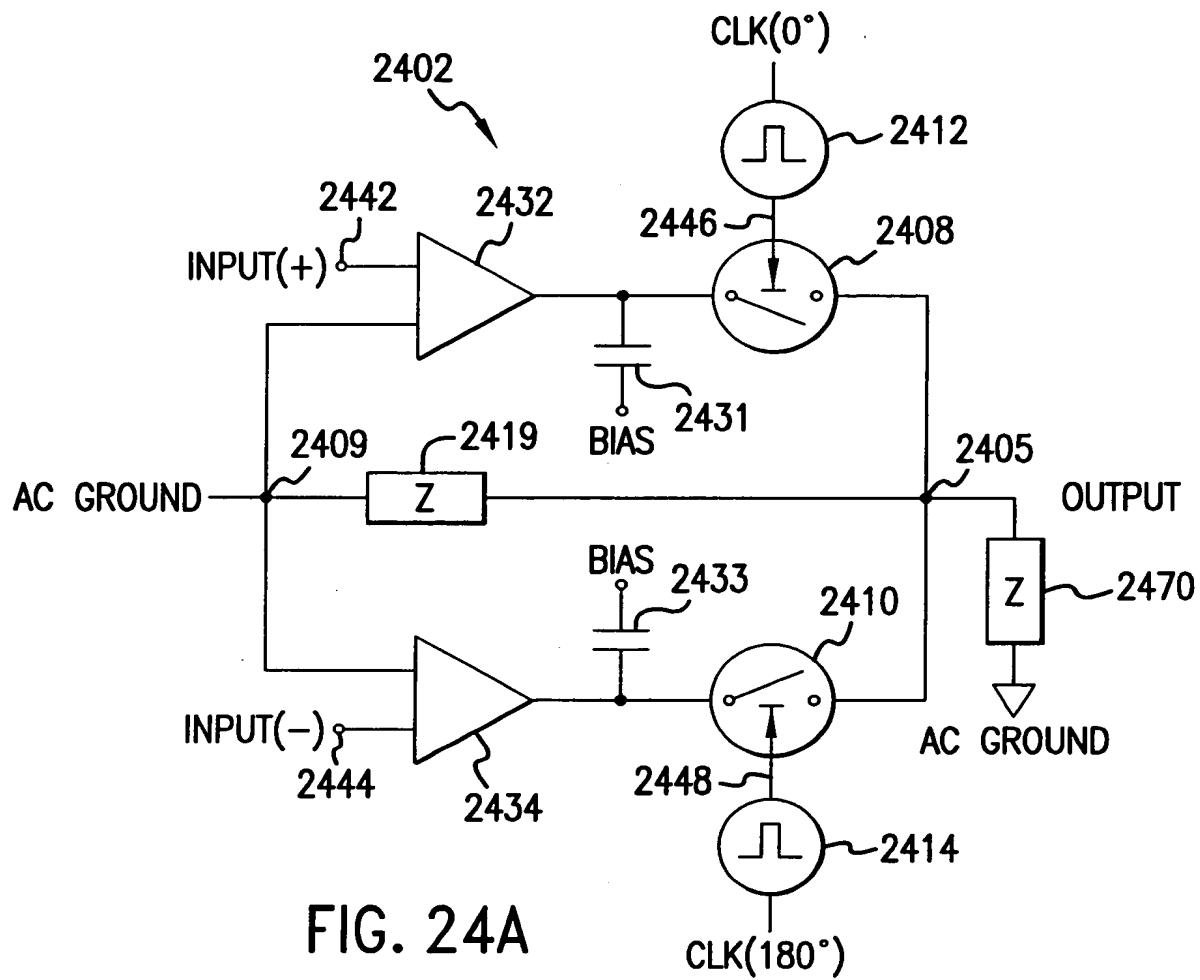


FIG. 24A

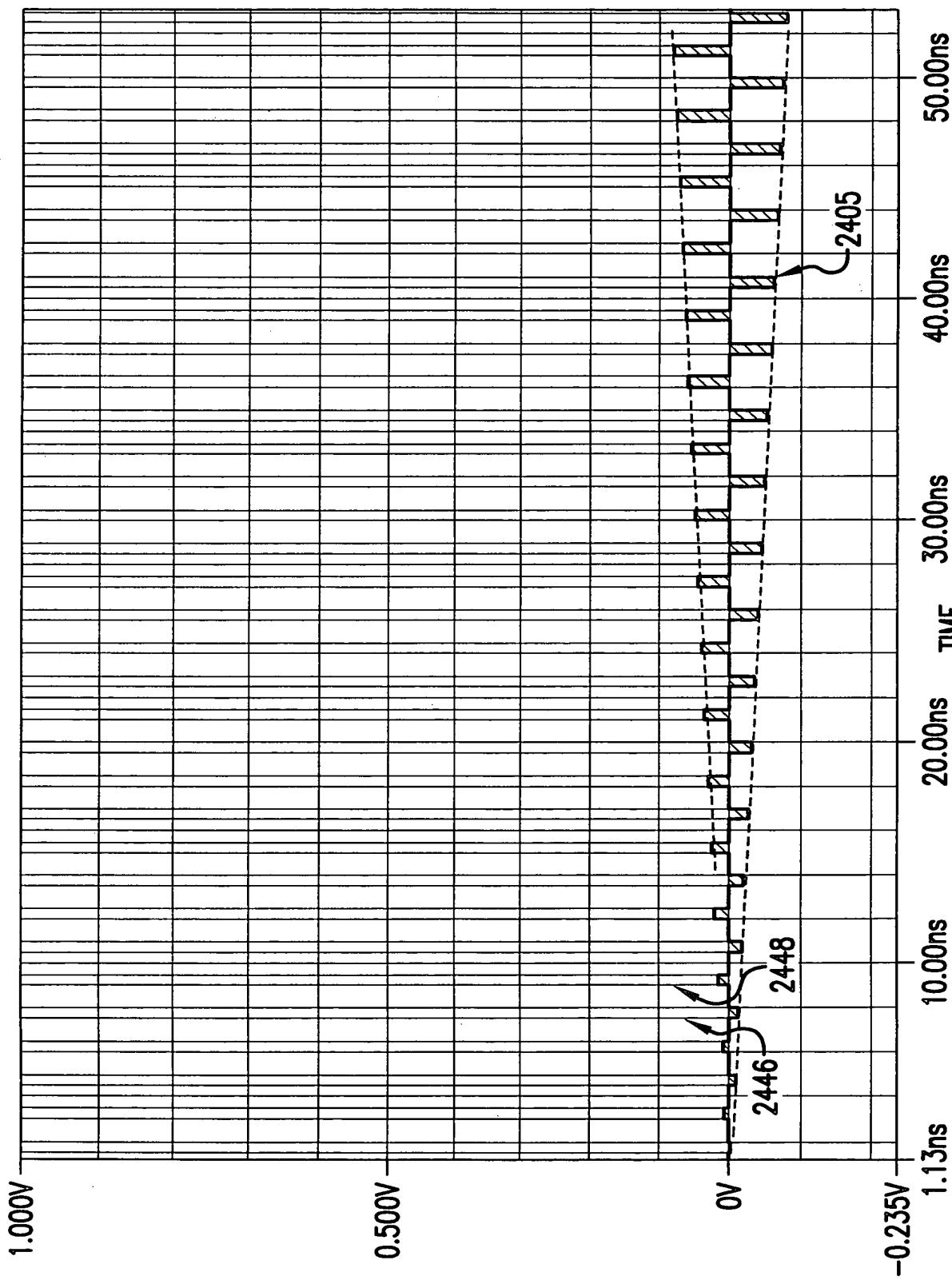


FIG. 24B

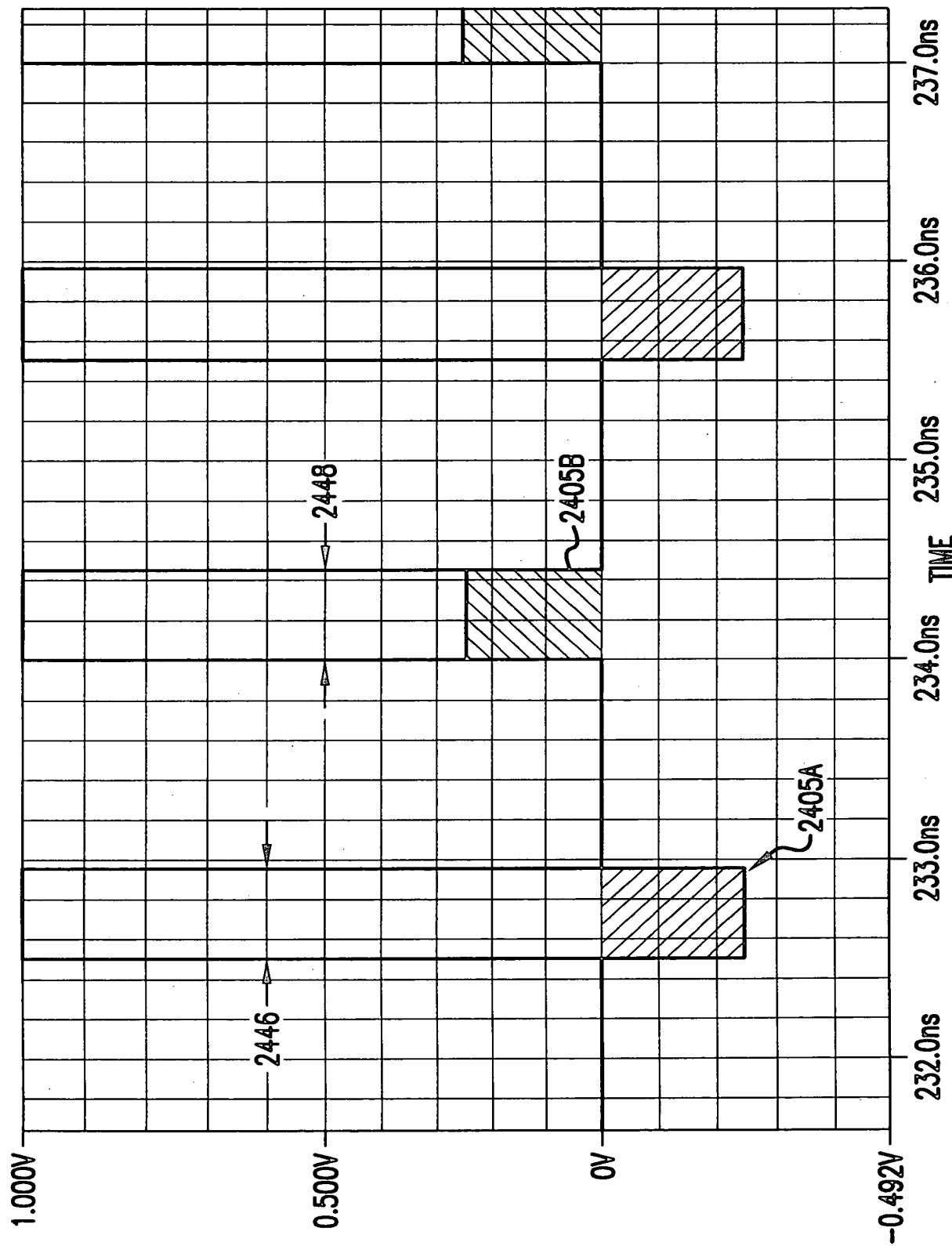


FIG. 24C

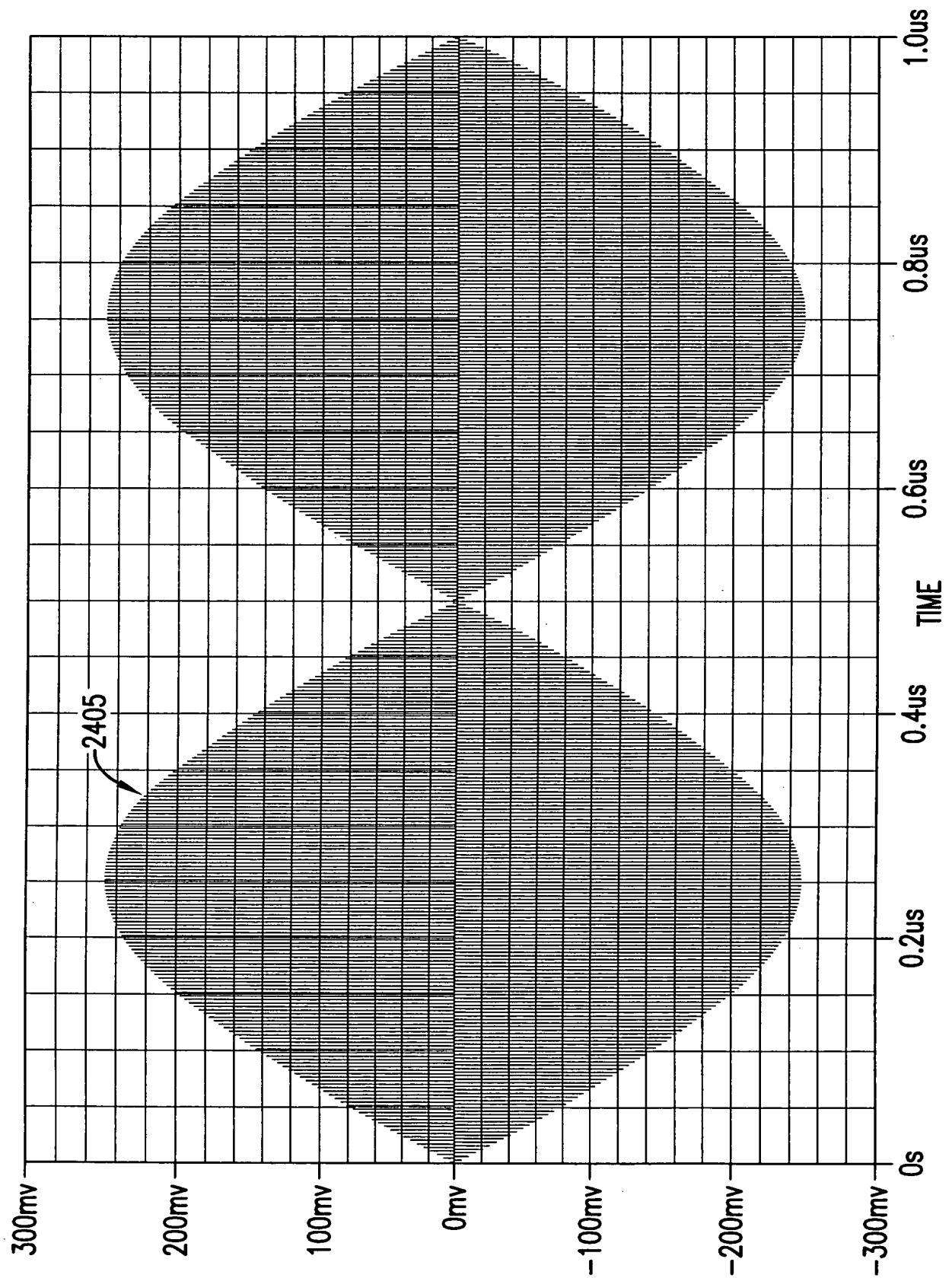
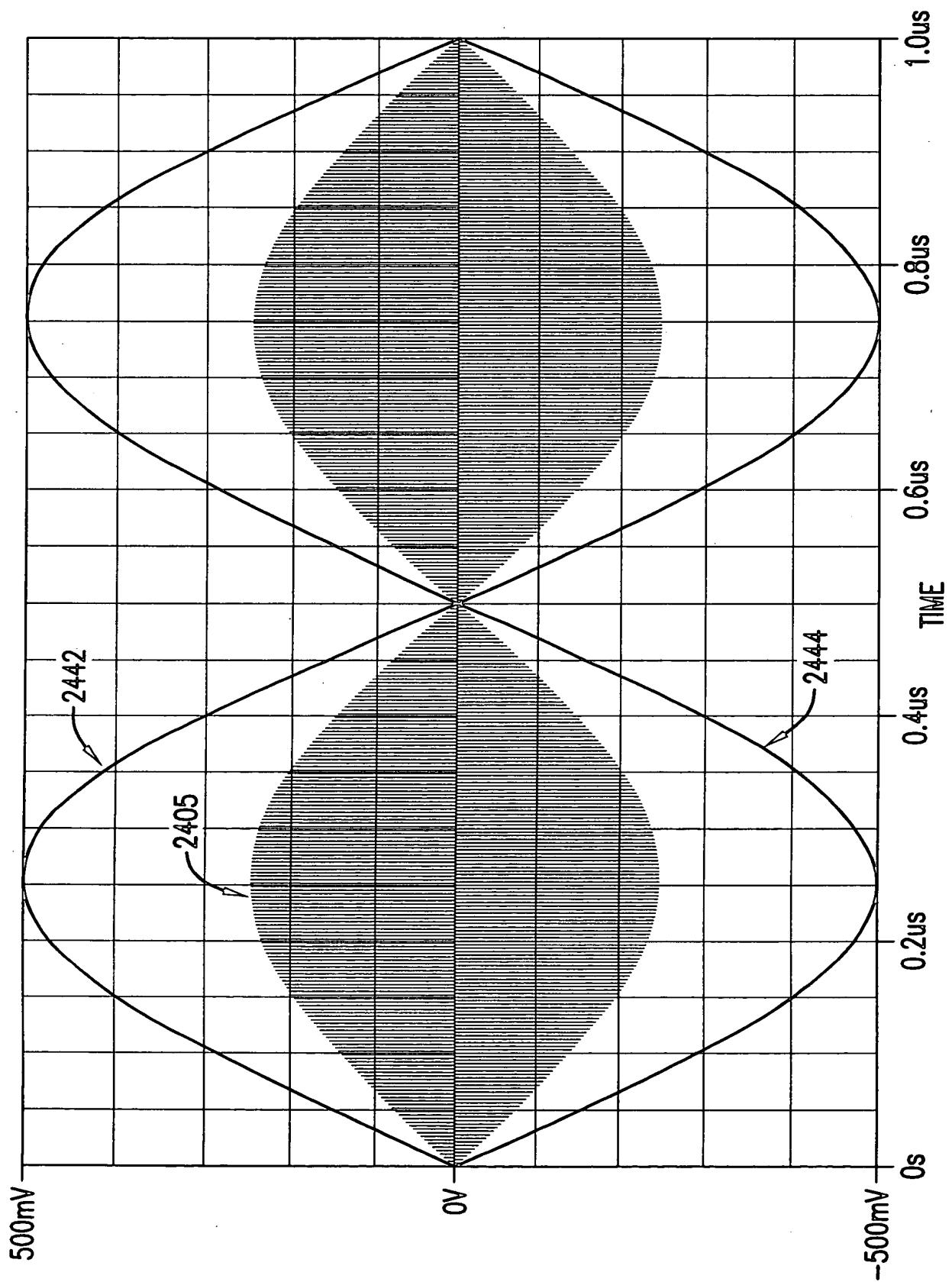


FIG. 24D



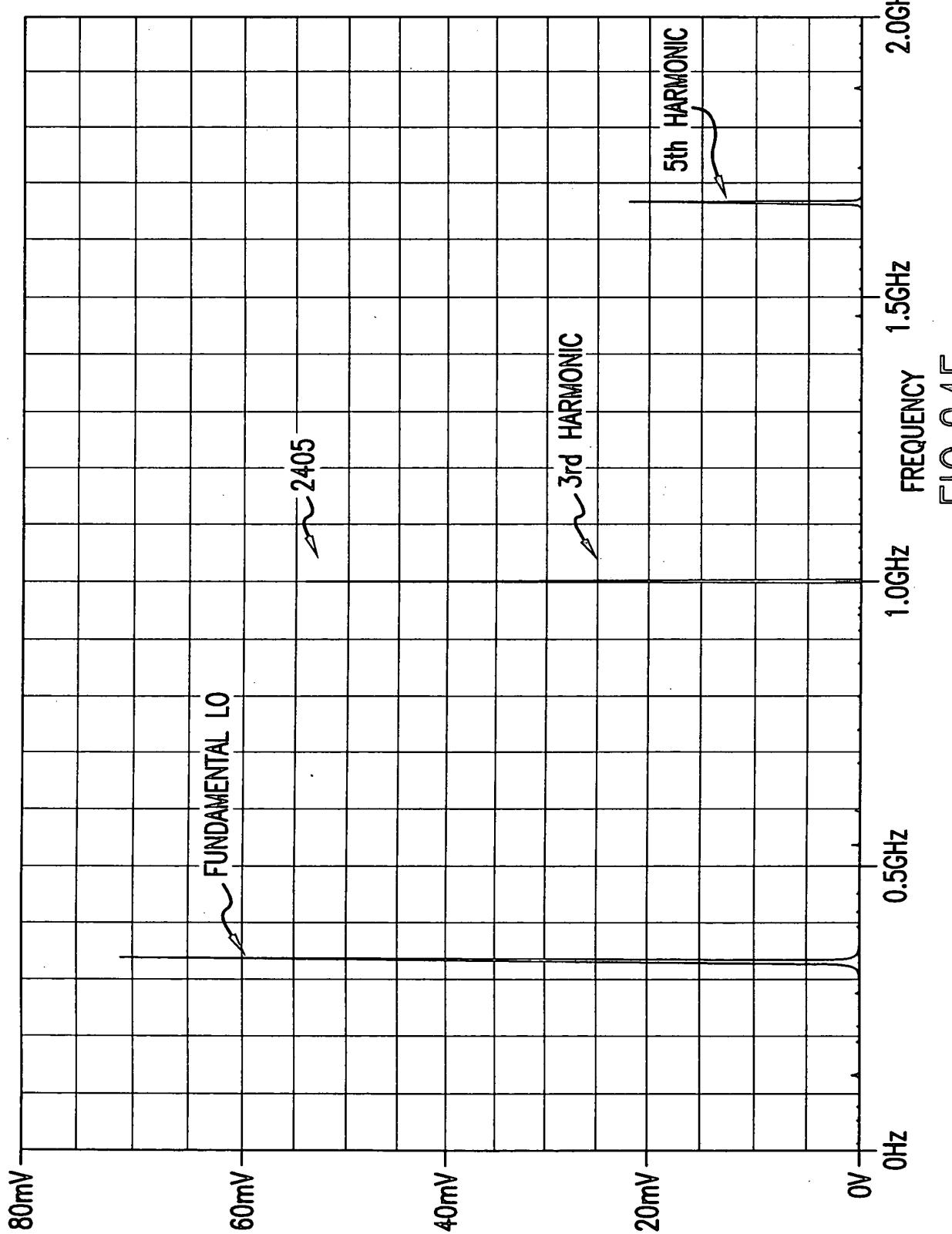
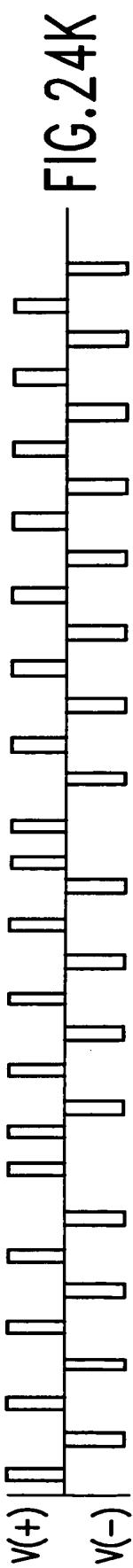
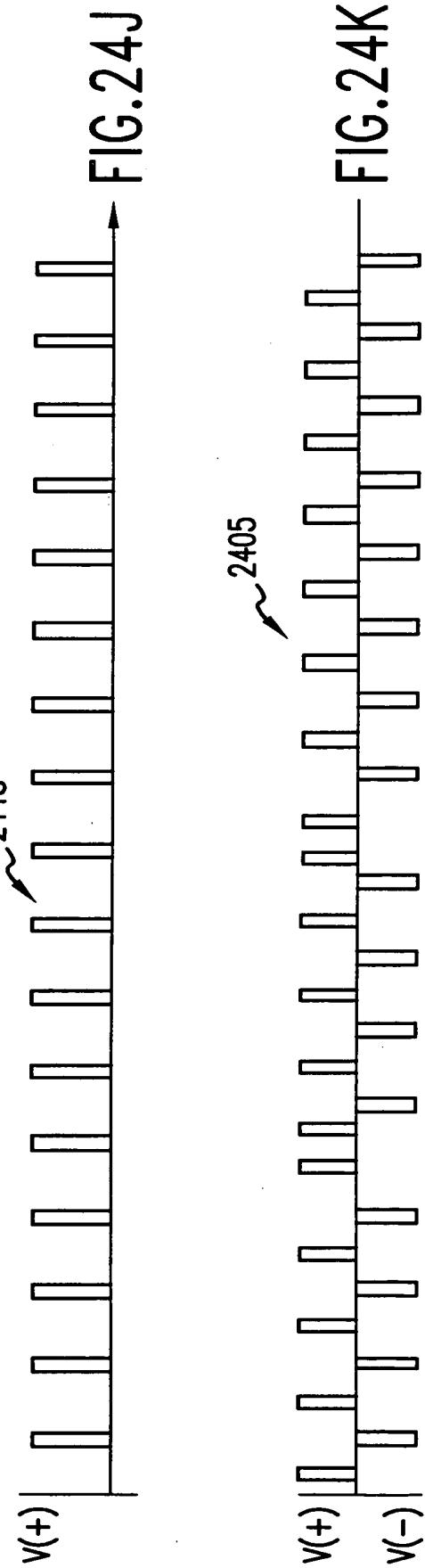
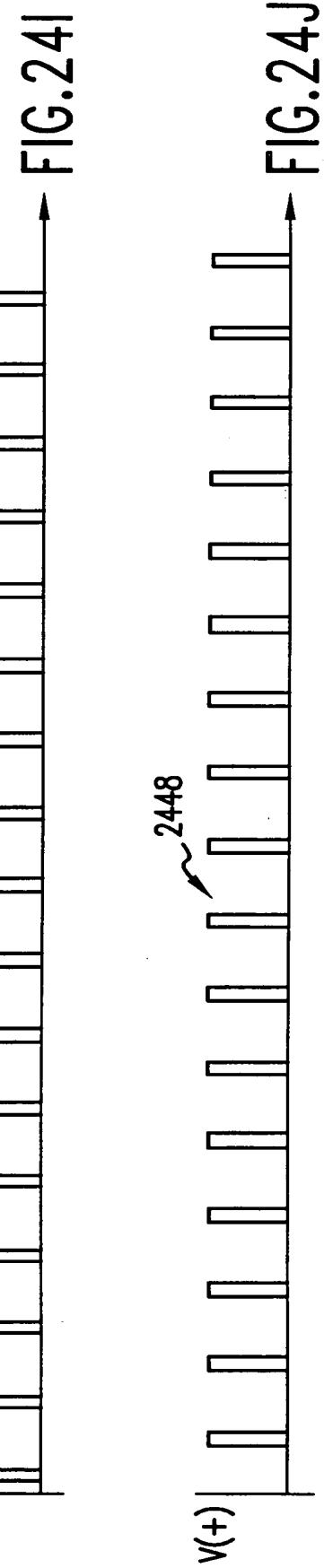
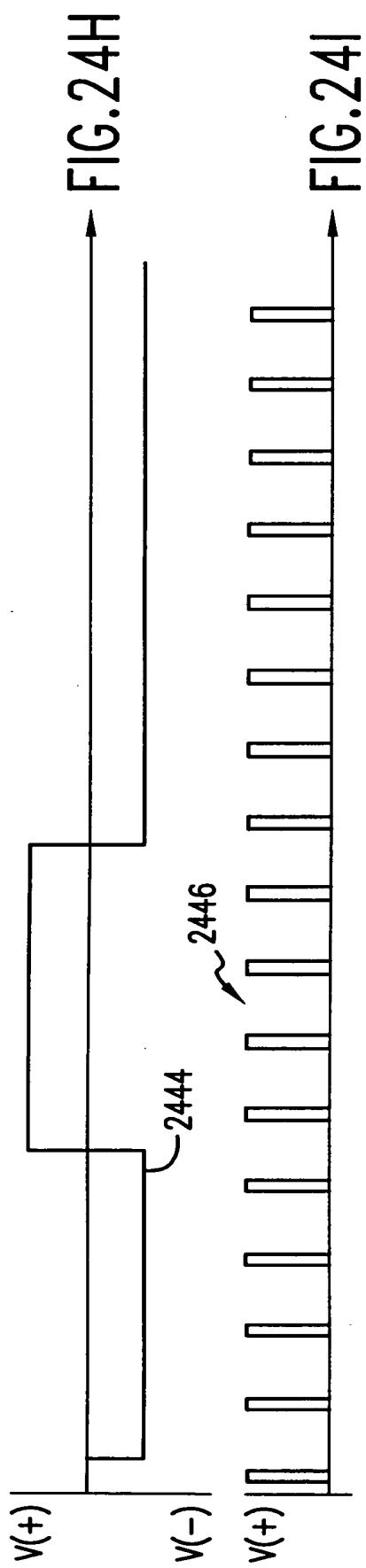
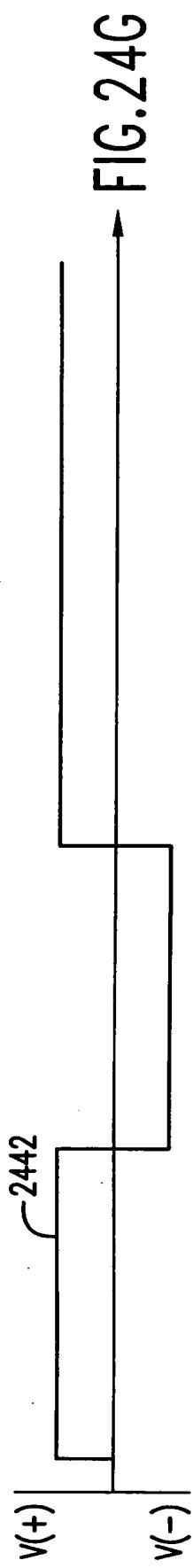


FIG. 24F



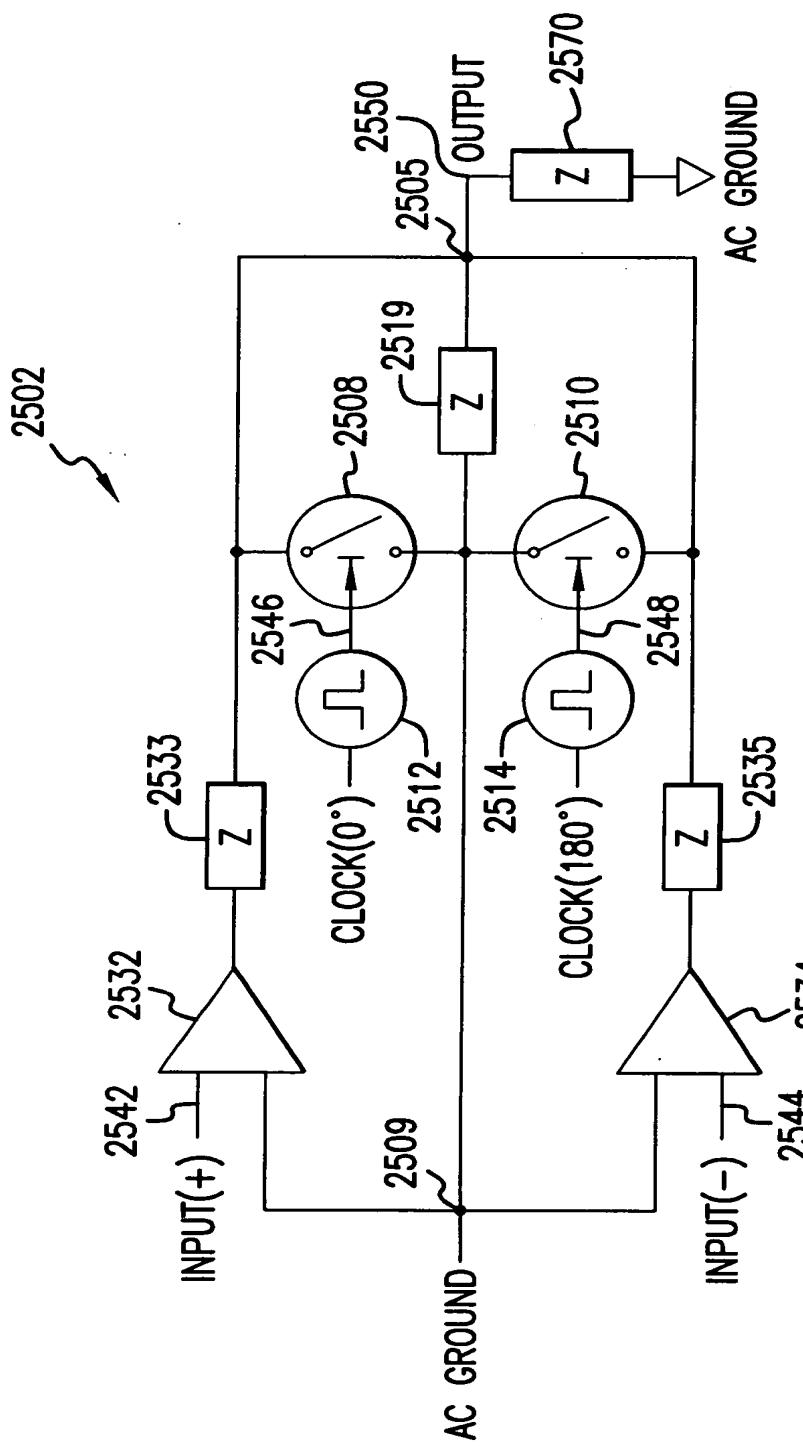


FIG. 25A

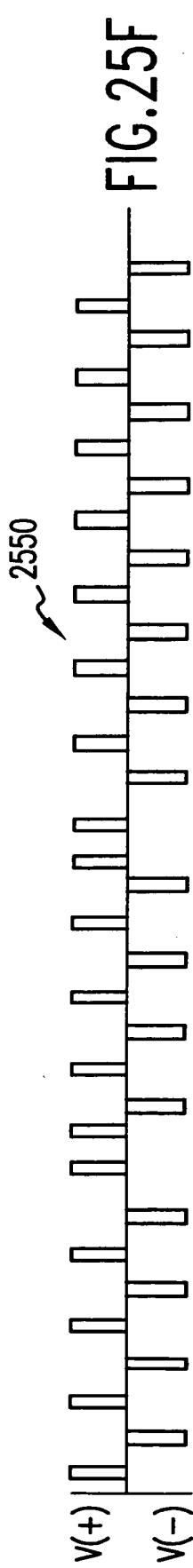
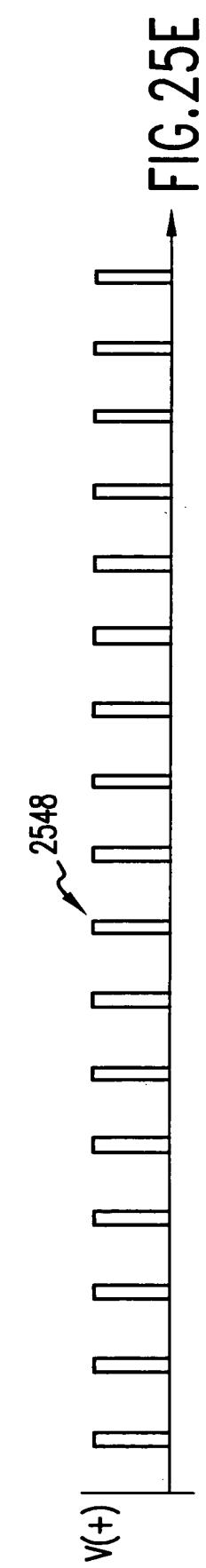
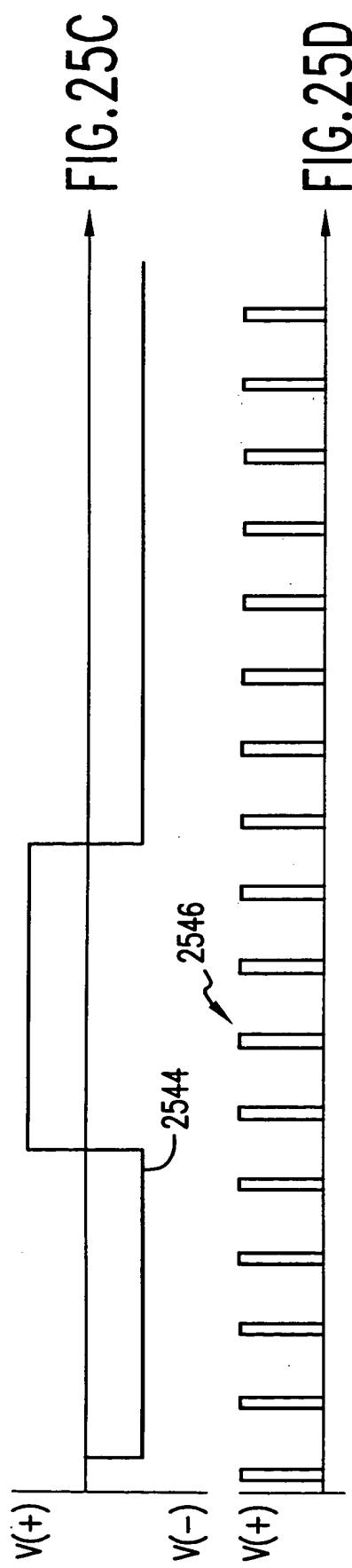
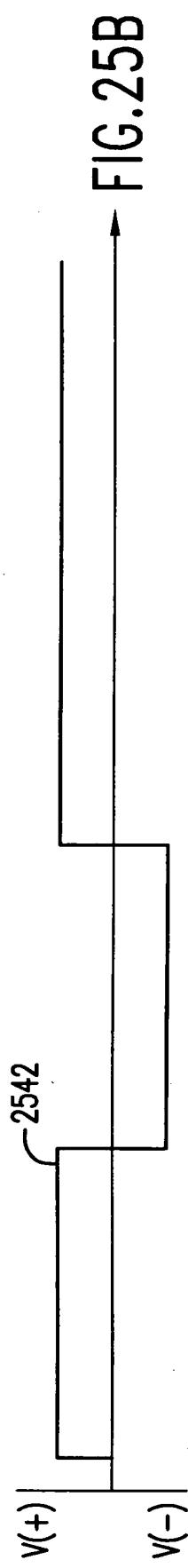
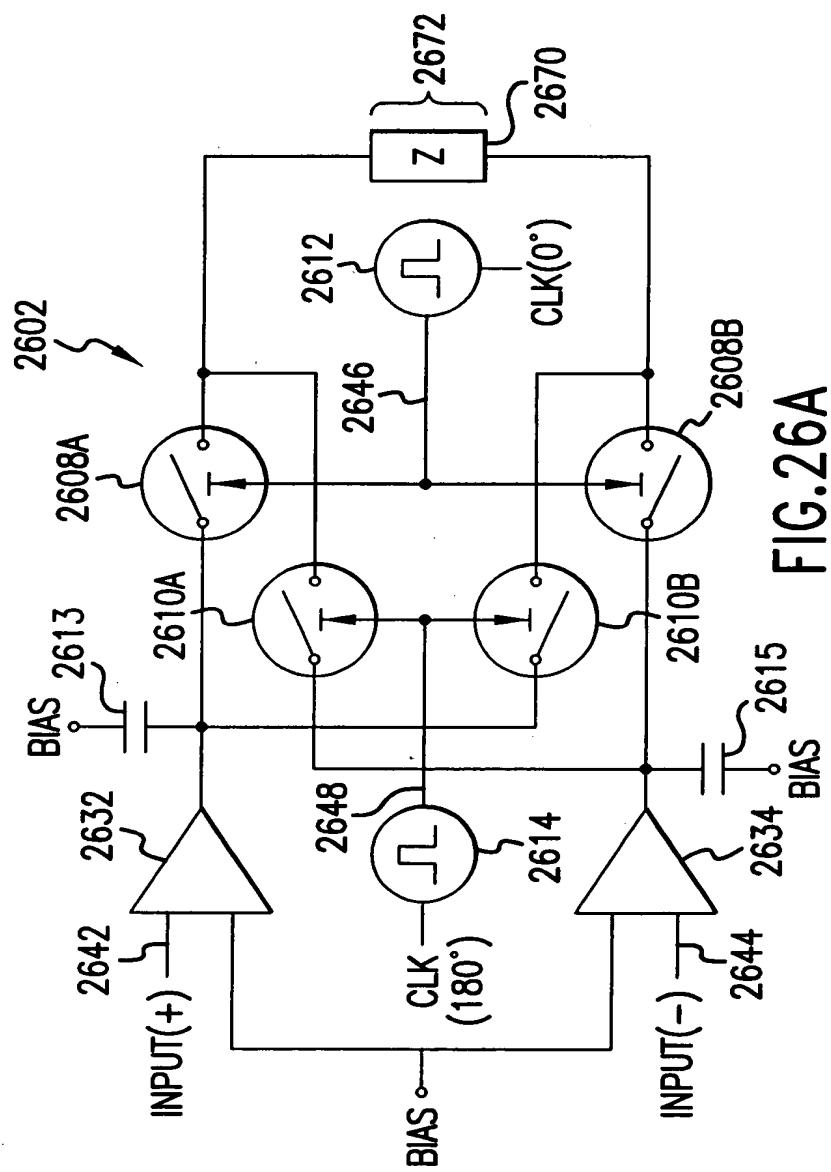
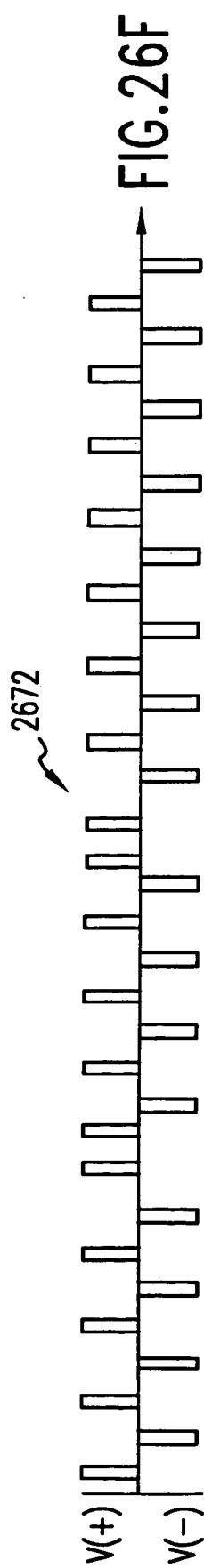
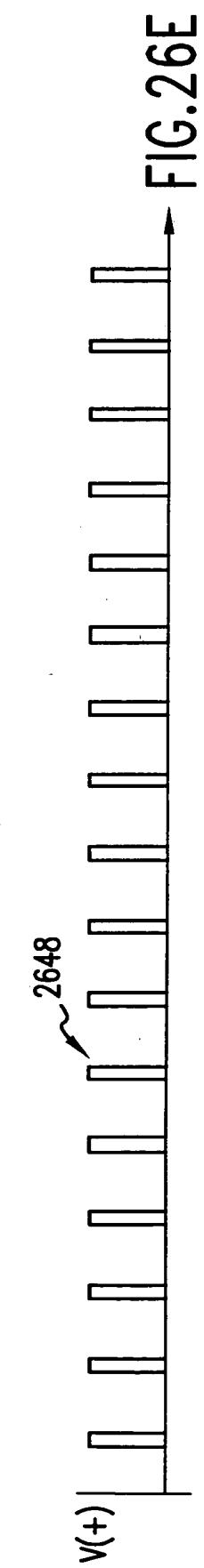
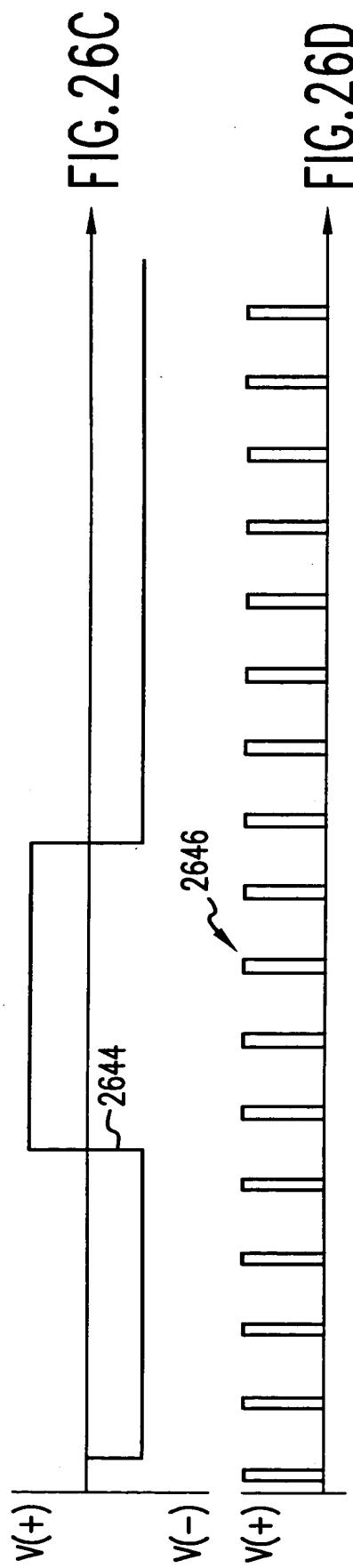
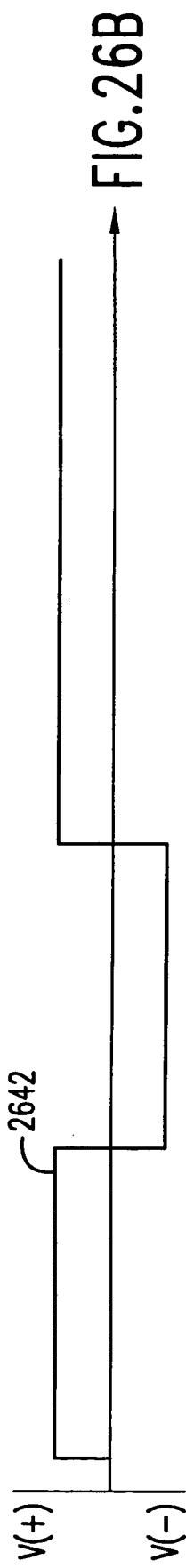


FIG. 25F





Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

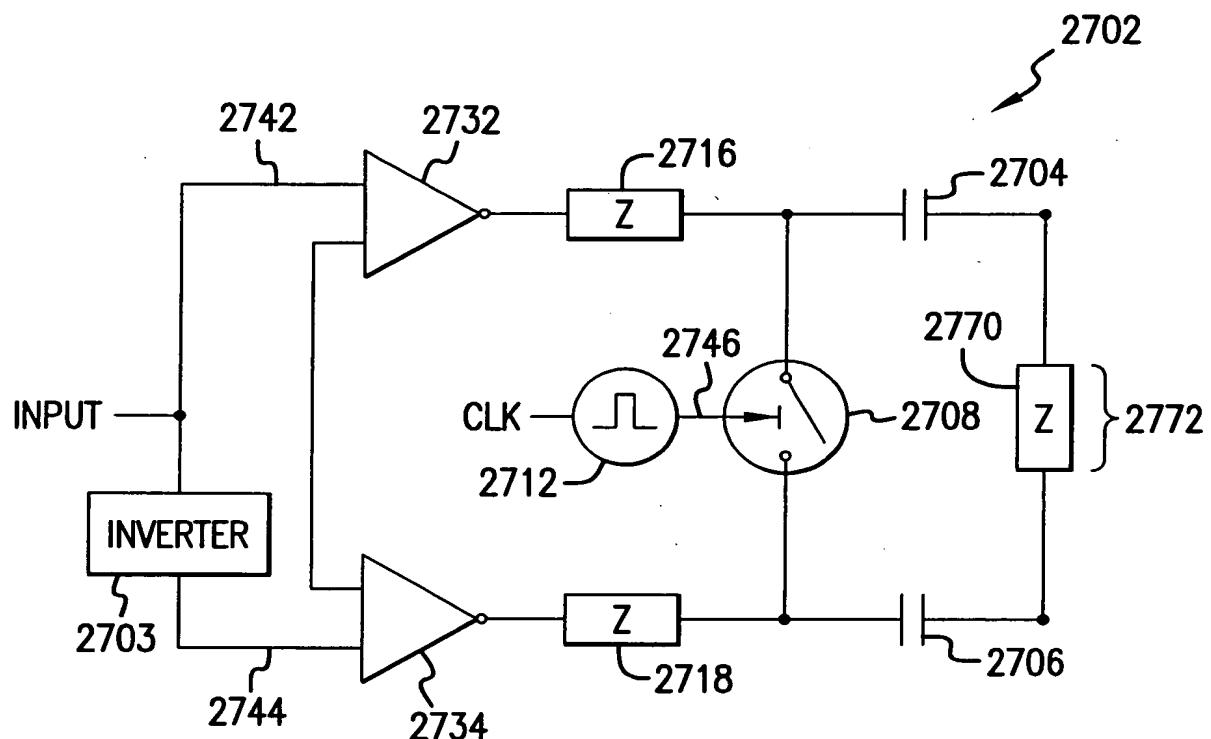
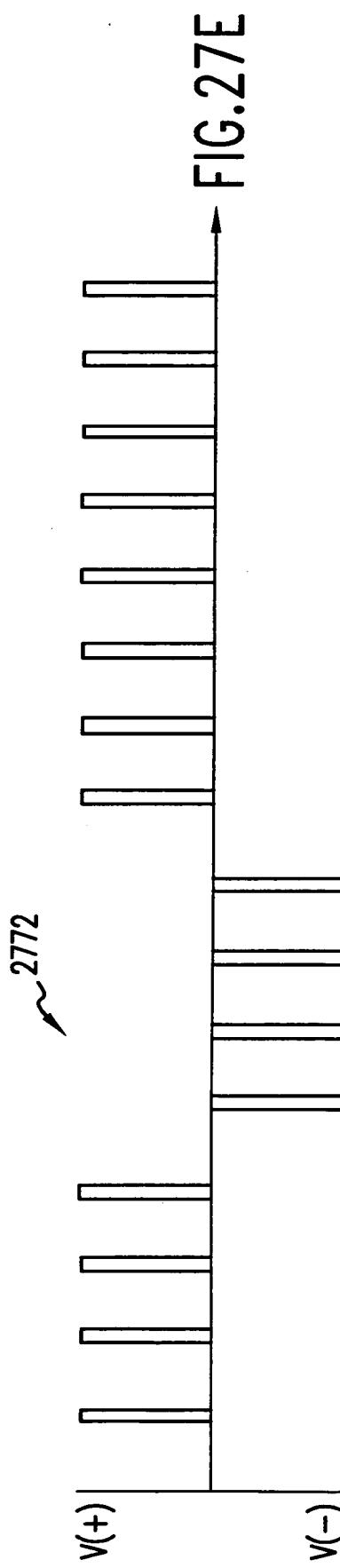
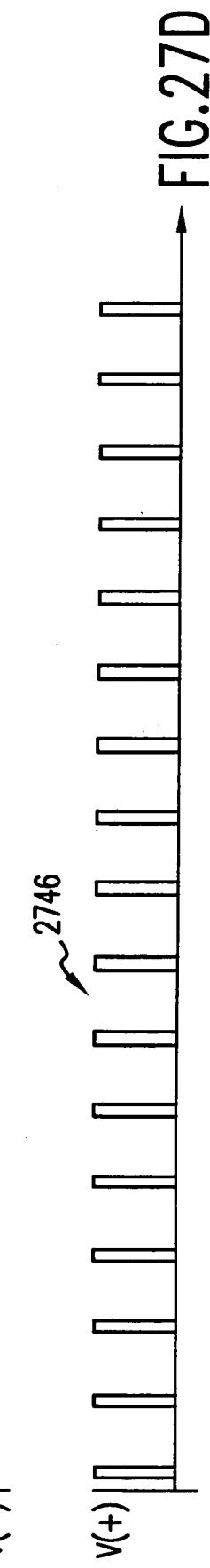
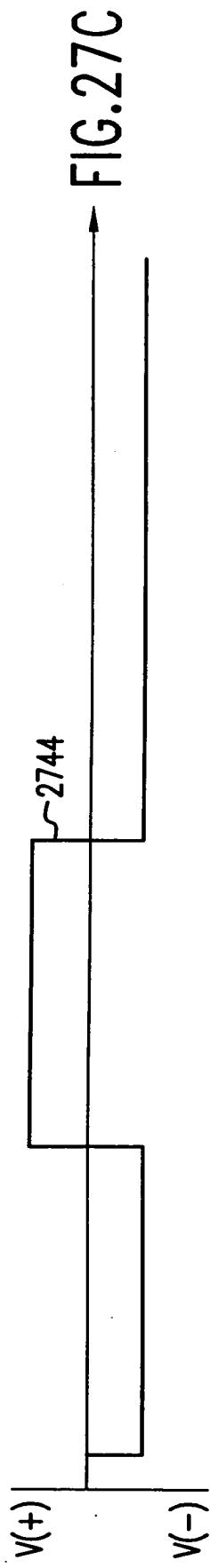
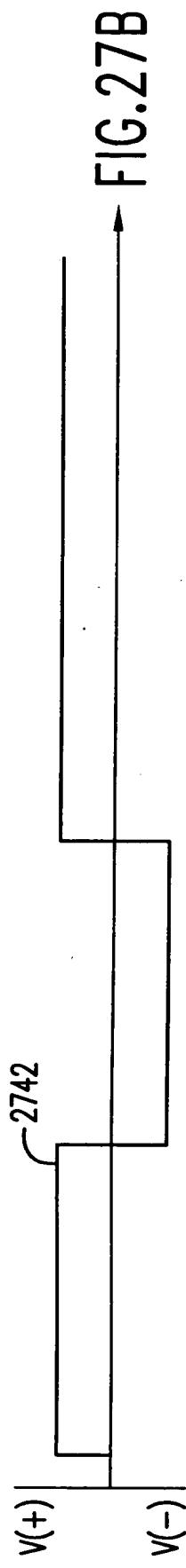
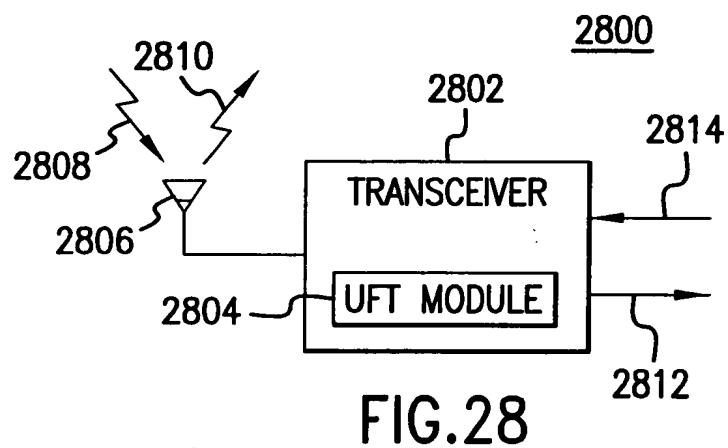


FIG.27A



Appl. No. 09/855,851; Group Art Unit: 2681
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and Up-Converting Electromagnetic Signals



EXEMPLARY RECEIVER FOR
UNIVERSAL FREQUENCY DOWN-CONVERSION

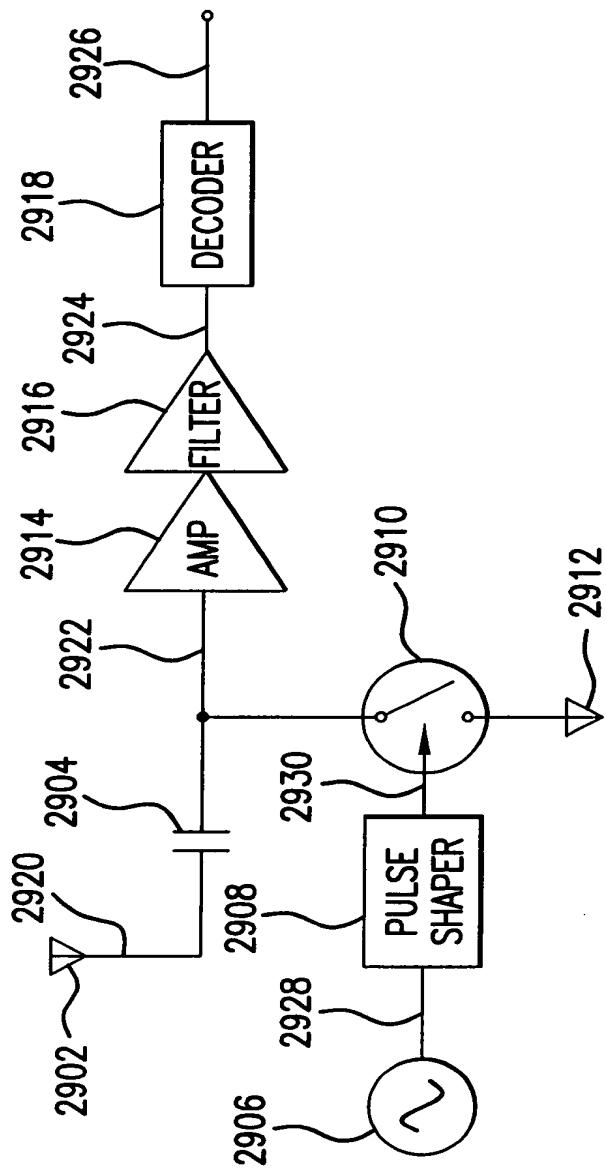


FIG. 29

EXEMPLARY TRANSMITTER USING THE PRESENT INVENTION

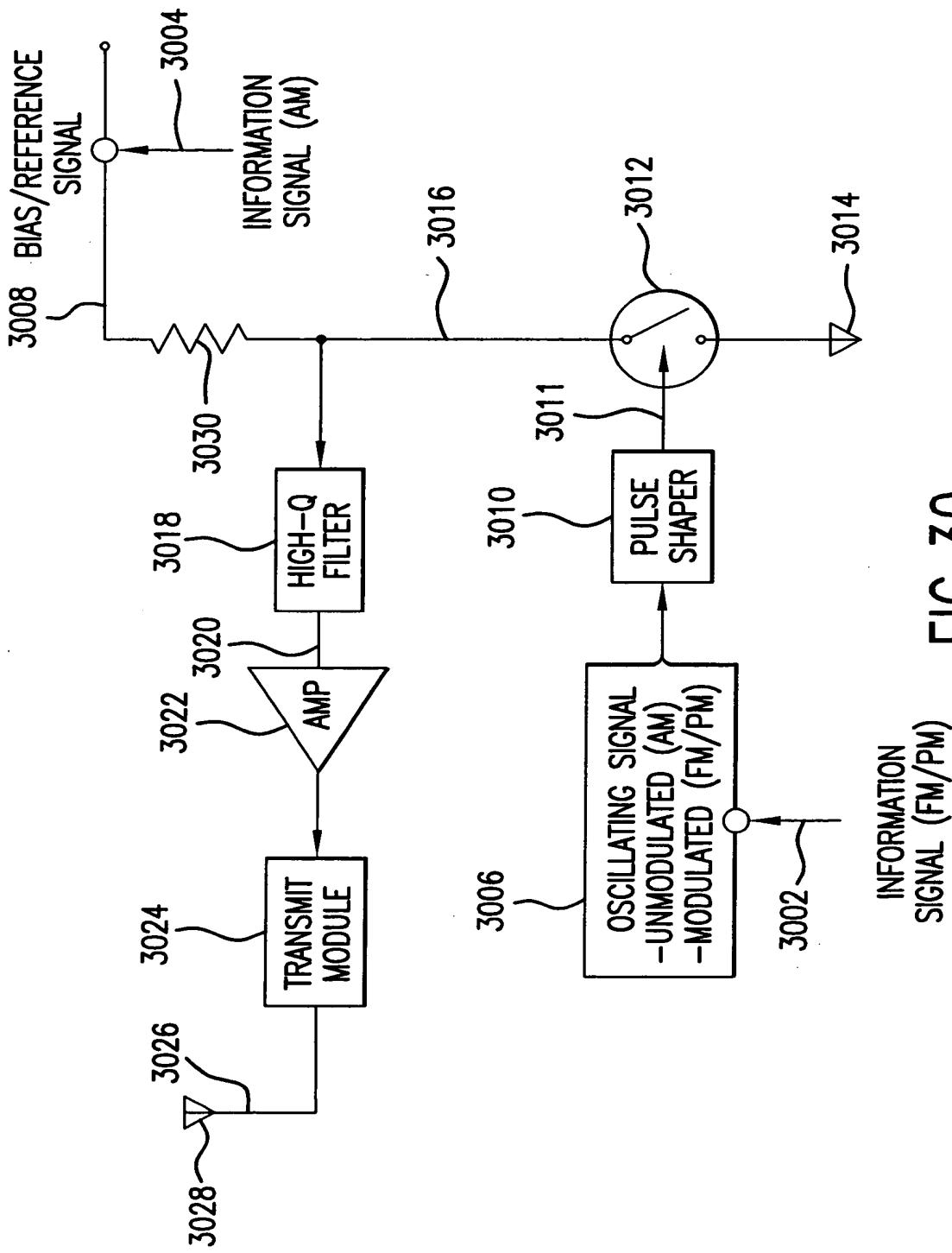
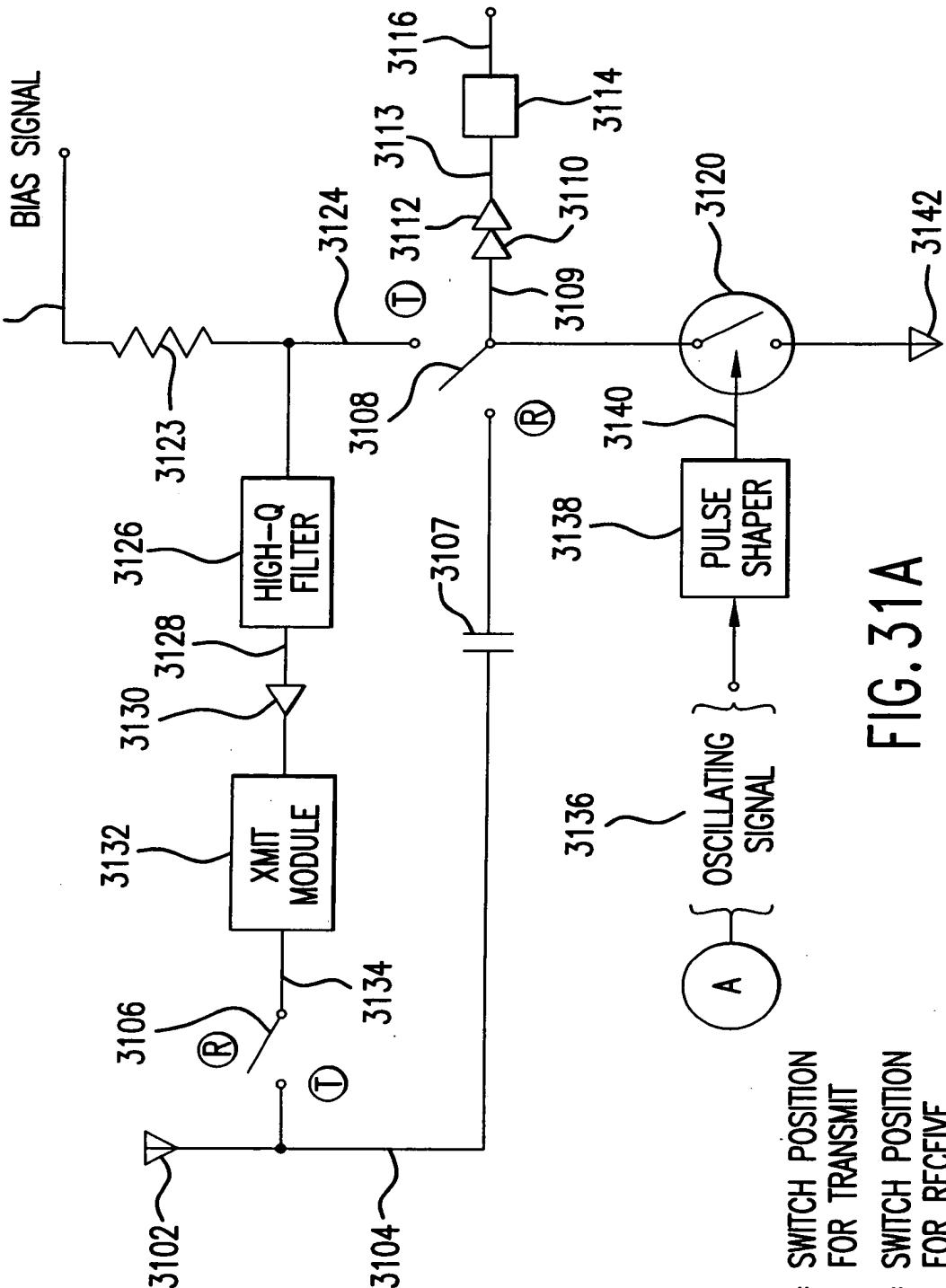


FIG. 30

TRANSMITTER USING PRESENT INVENTION IN A
 HALF DUPLEX COMMUNICATIONS CIRCUIT WITH A
 UNIVERSAL FREQUENCY DOWN-CONVERTER (FM & PM)
 3122

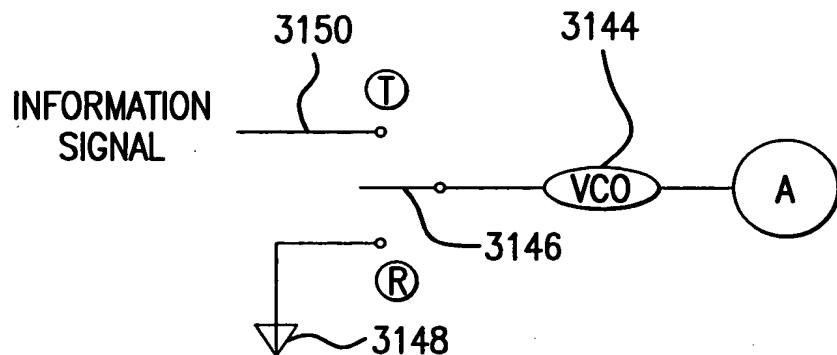


① = SWITCH POSITION
 FOR TRANSMIT

② = SWITCH POSITION
 FOR RECEIVE

FIG. 31A

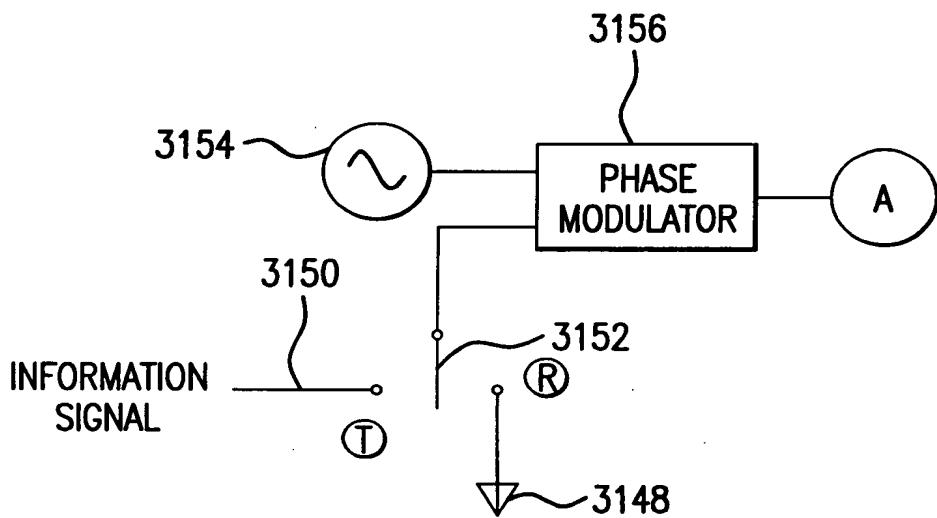
FM MODE



(T) = SWITCH POSITION FOR TRANSMIT
 (R) = SWITCH POSITION FOR RECEIVE

FIG. 31B

PM MODE



(T) = SWITCH POSITION FOR TRANSMIT
 (R) = SWITCH POSITION FOR RECEIVE

FIG. 31C

TRANSMITTER USING PRESENT INVENTION IN A
 HALF-DUPLEX COMMUNICATIONS CIRCUIT WITH A
 UNIVERSAL FREQUENCY DOWN-CONVERTER (AM)

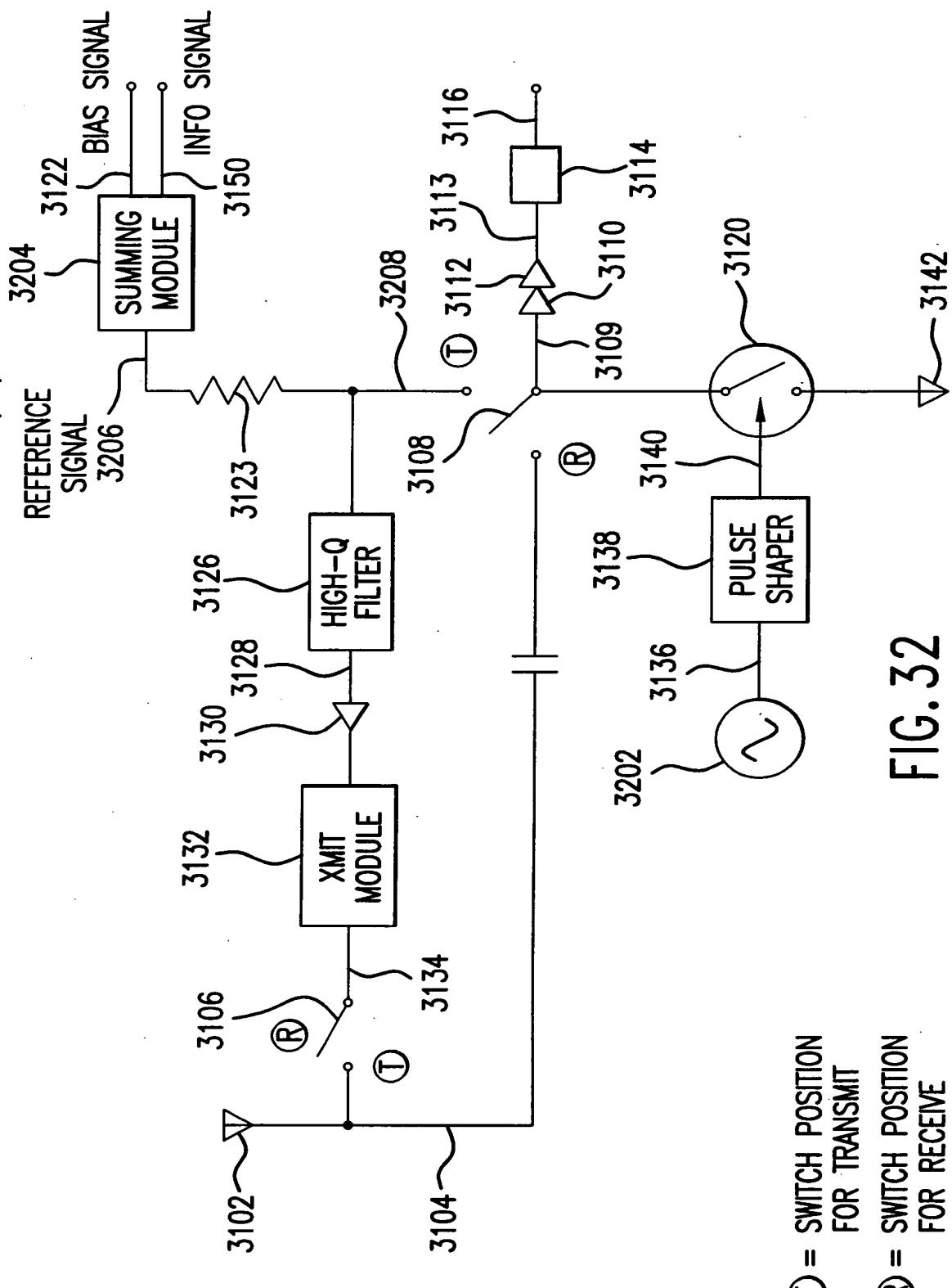


FIG. 32

TRANSMITTER USING PRESENT INVENTION IN
FULL DUPLEX COMMUNICATIONS CIRCUIT WITH A
UNIVERSAL FREQUENCY DOWN-CONVERTER
3346
BIAS/REFERENCE SIGNAL

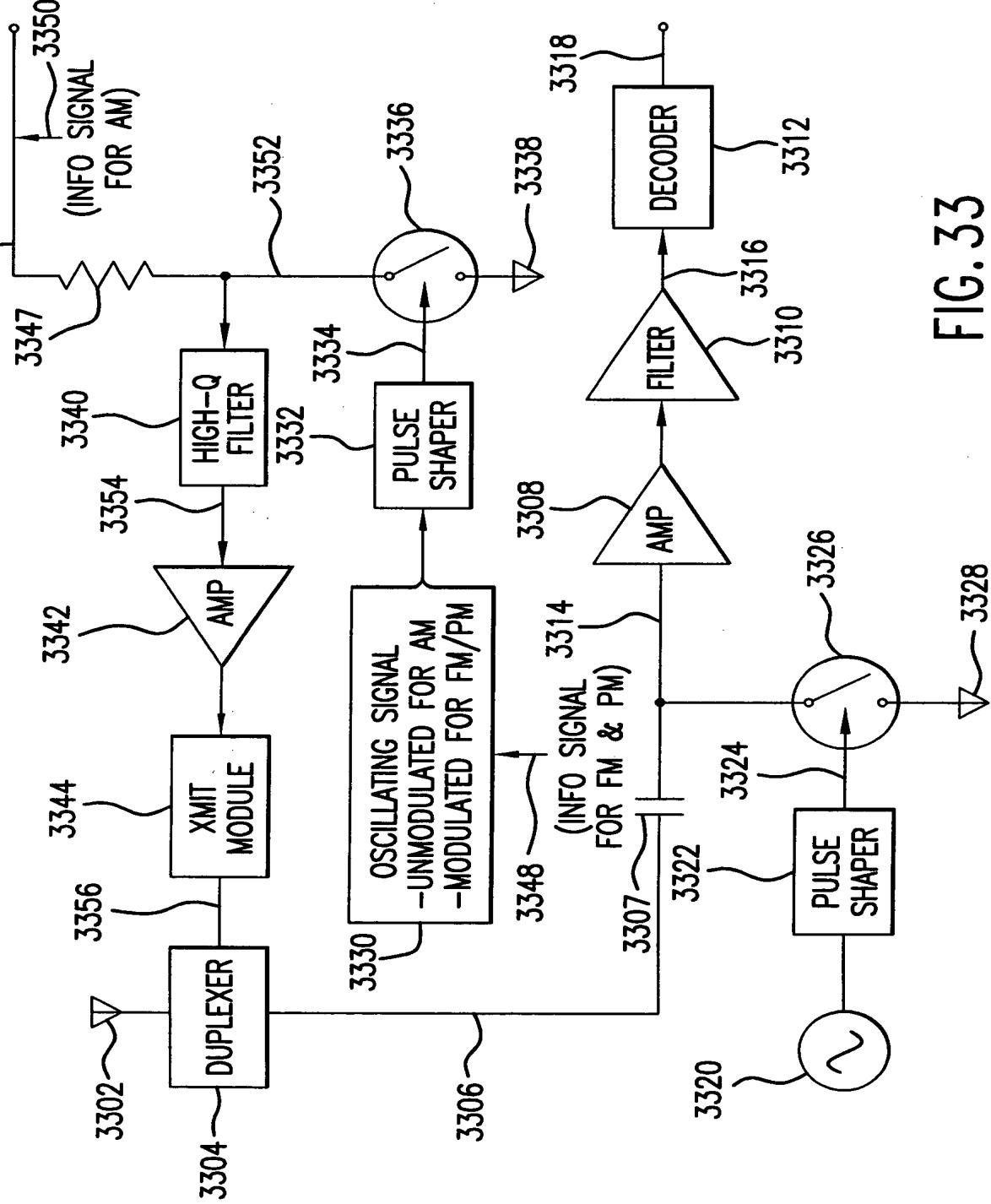


FIG. 33

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

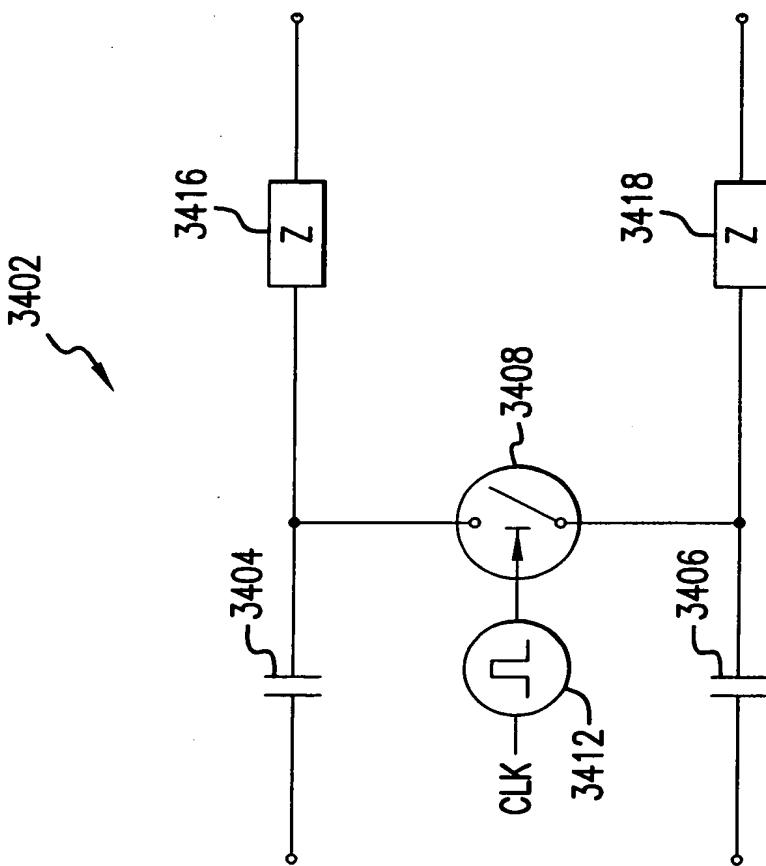


FIG. 34

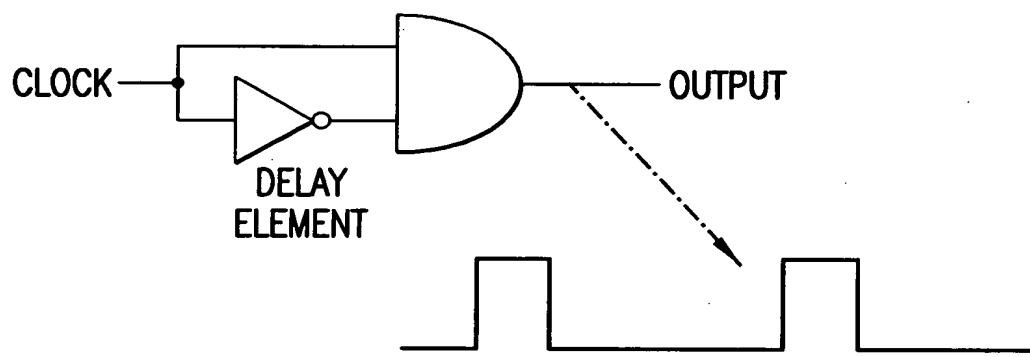


FIG.35

FIG.36

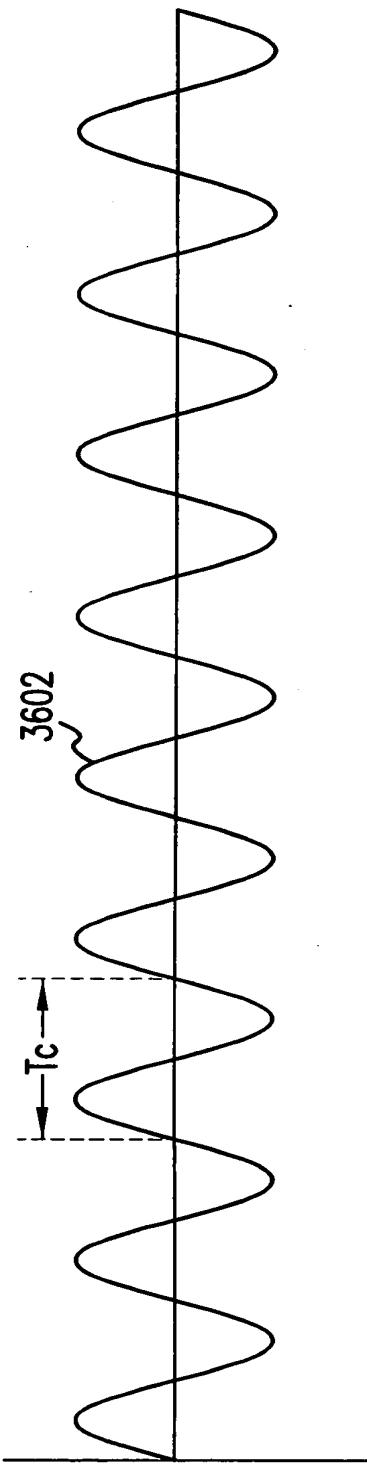


FIG.37

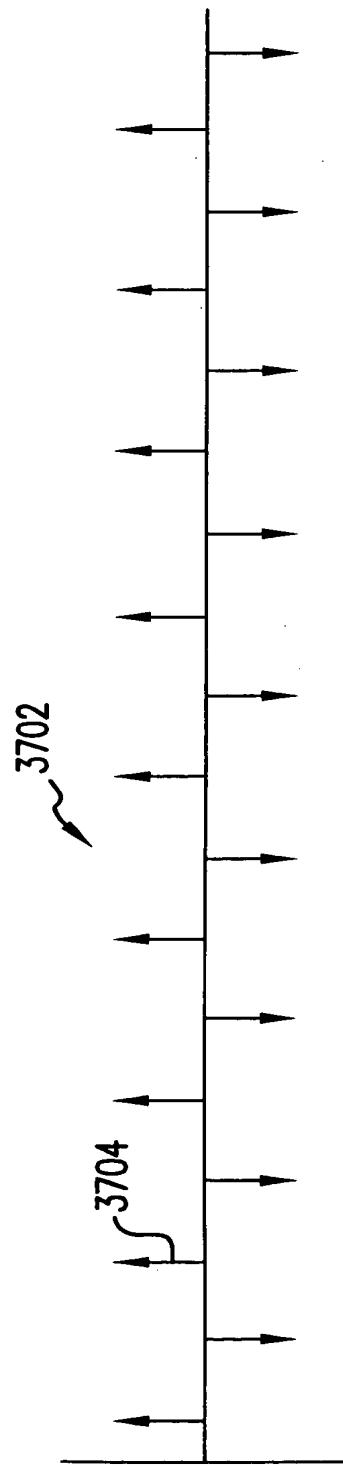
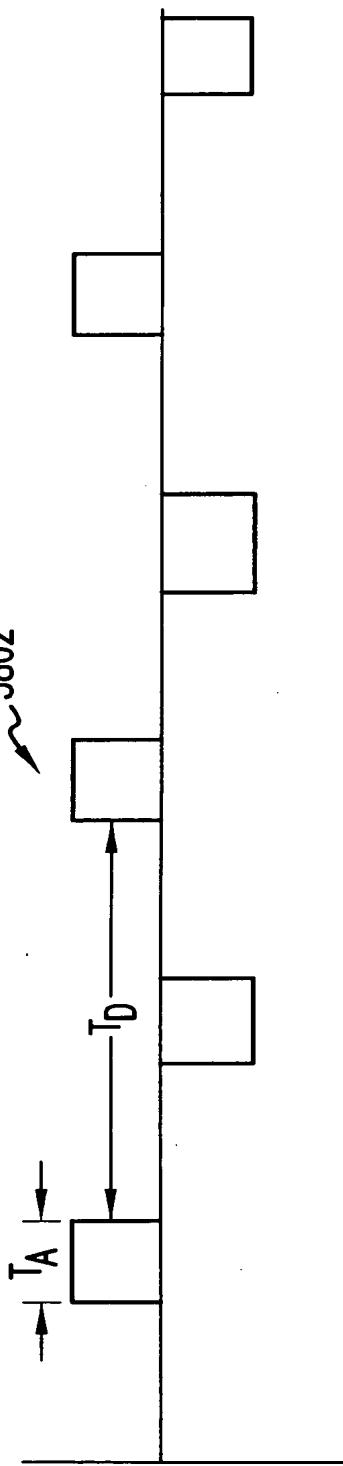


FIG.38



Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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and Up-Converting Electromagnetic Signals

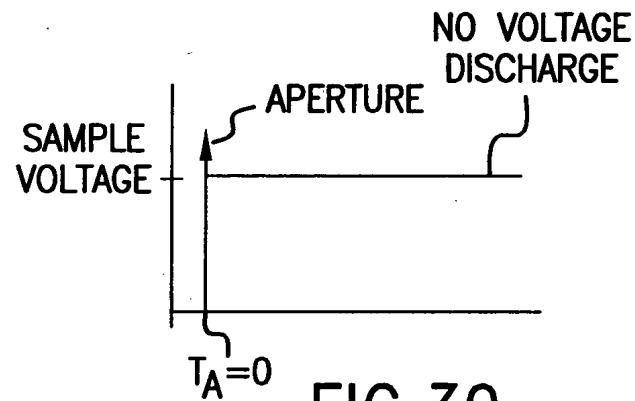


FIG.39

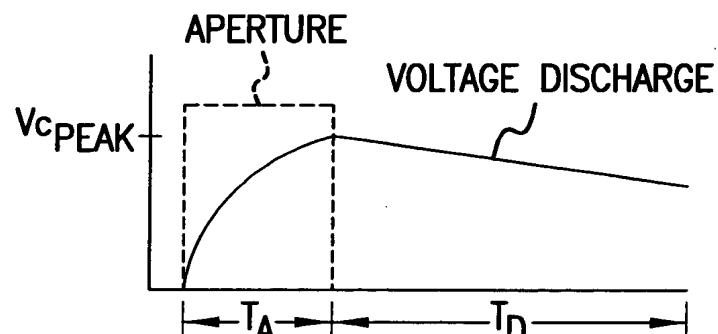
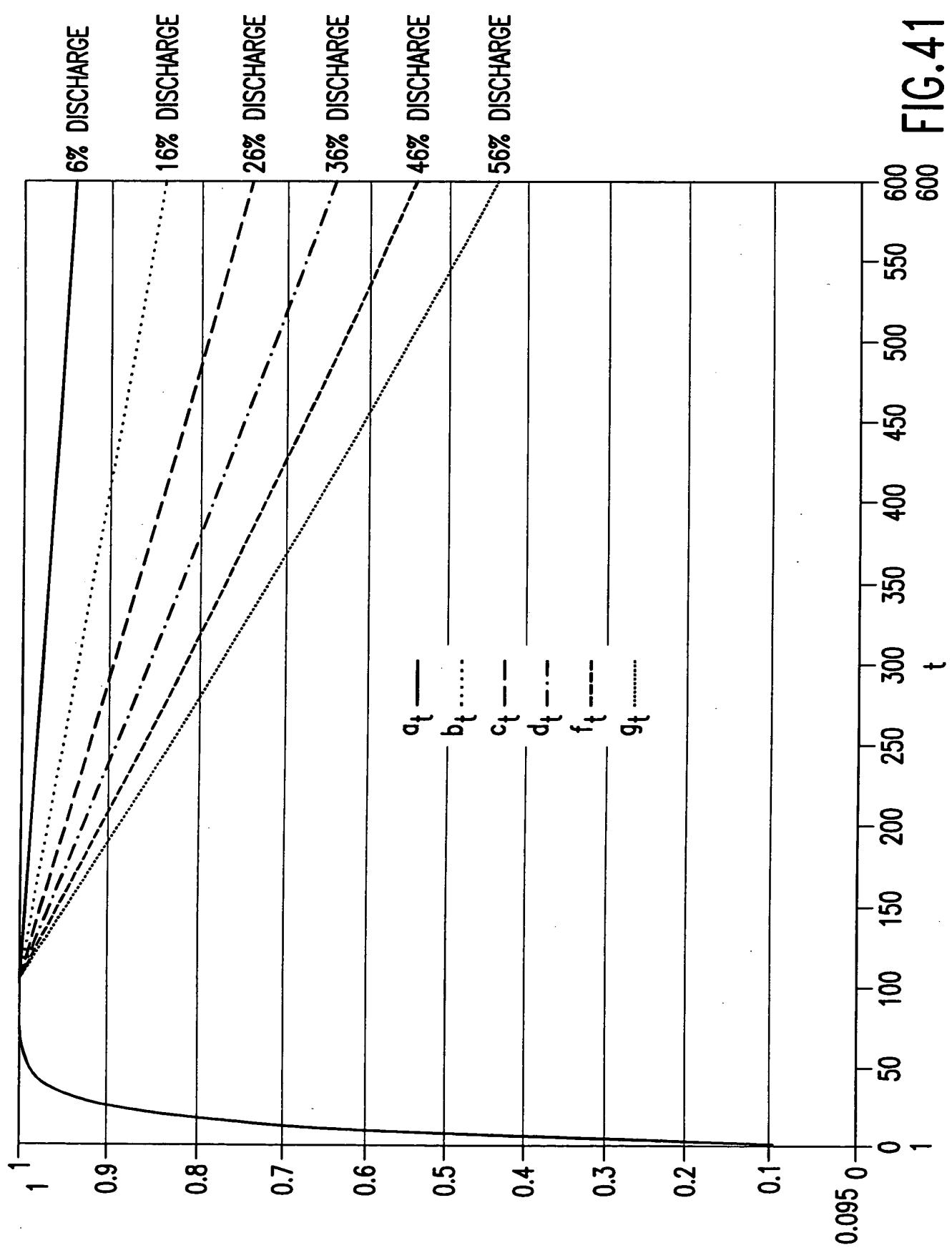
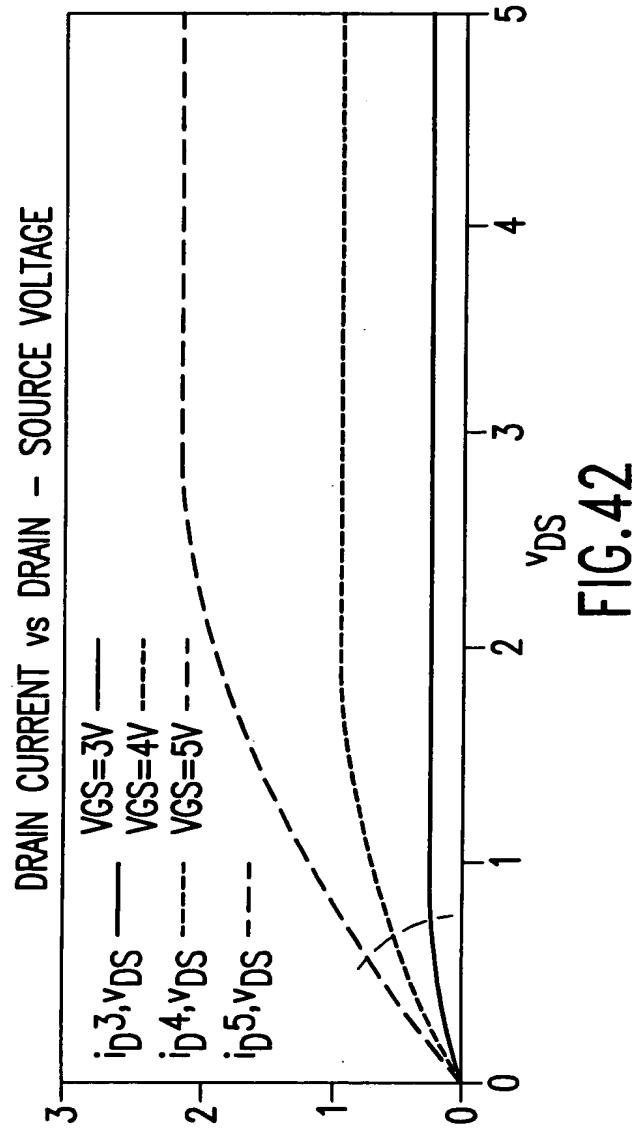
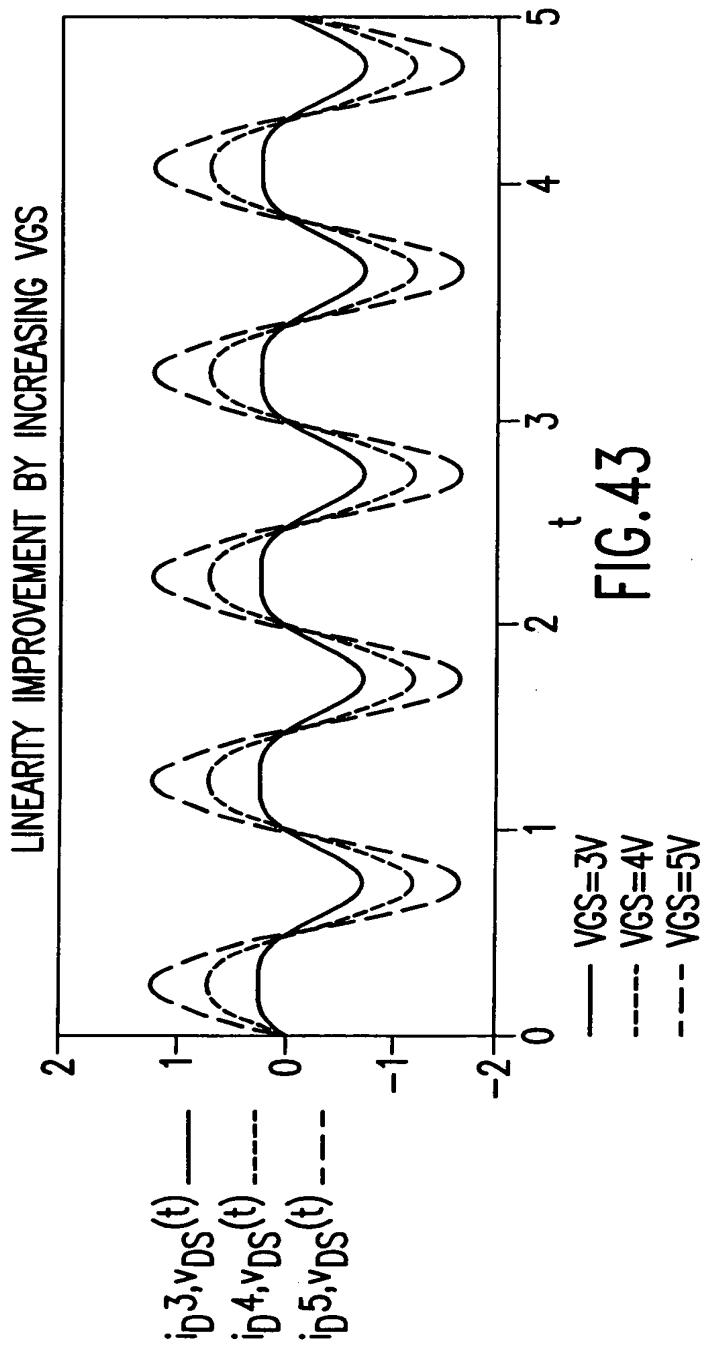


FIG.40



Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals





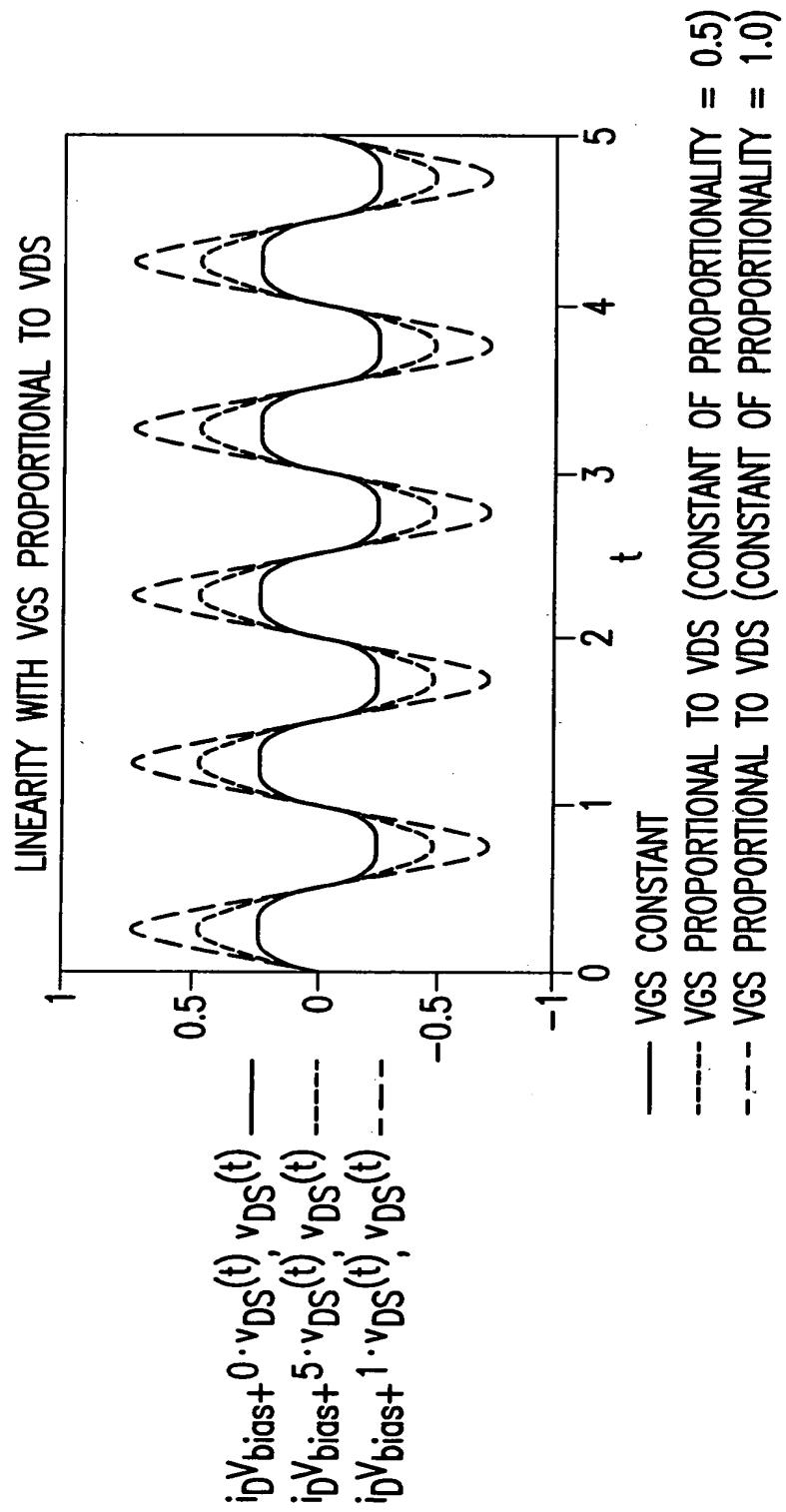


FIG. 44

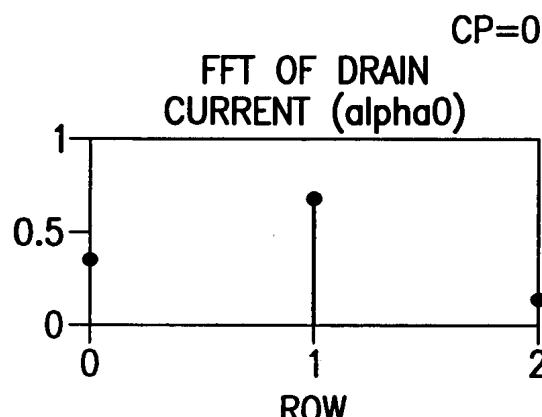


FIG.45A

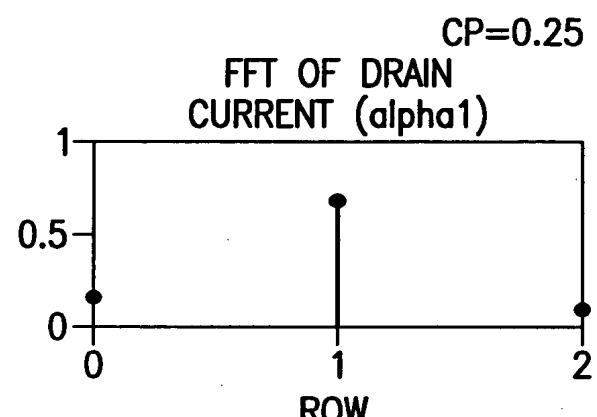


FIG.45B

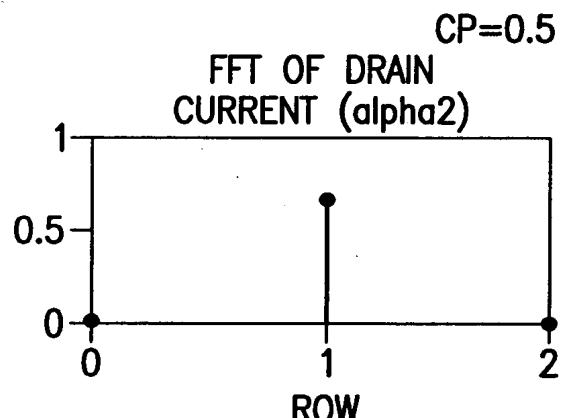


FIG.45C

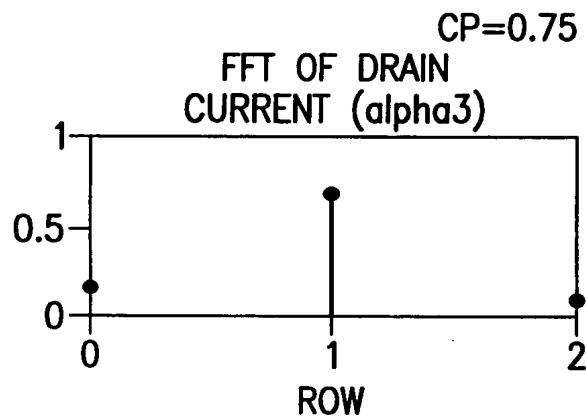


FIG.45D

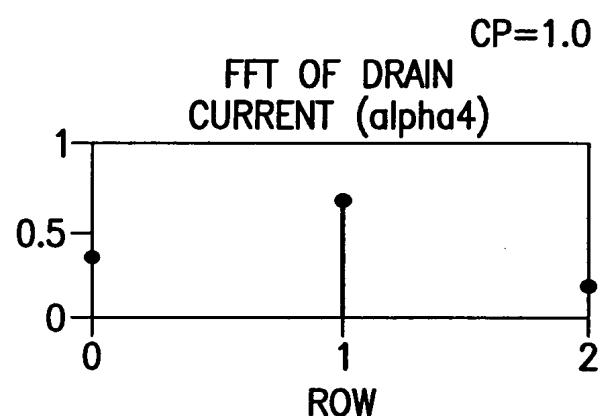
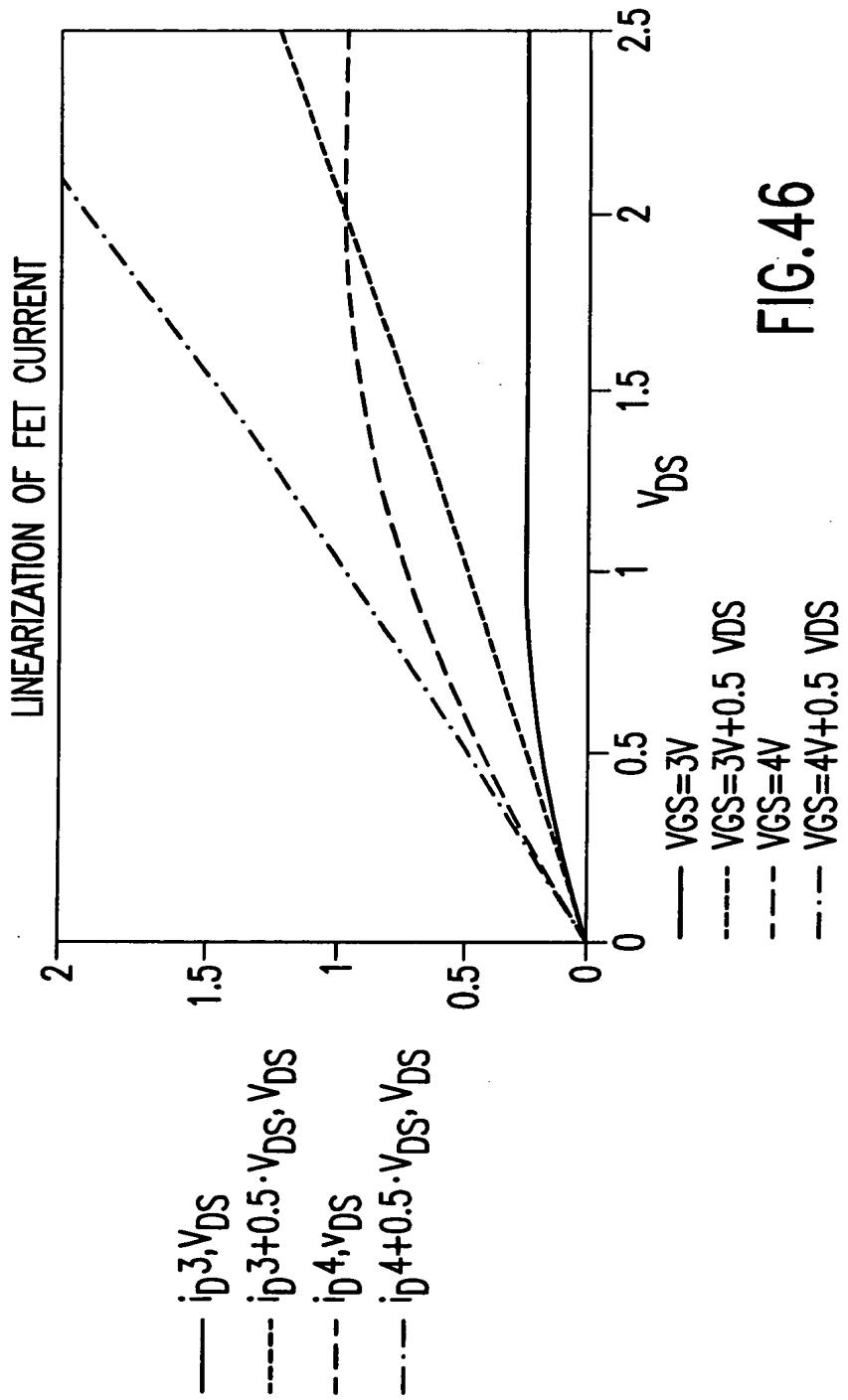
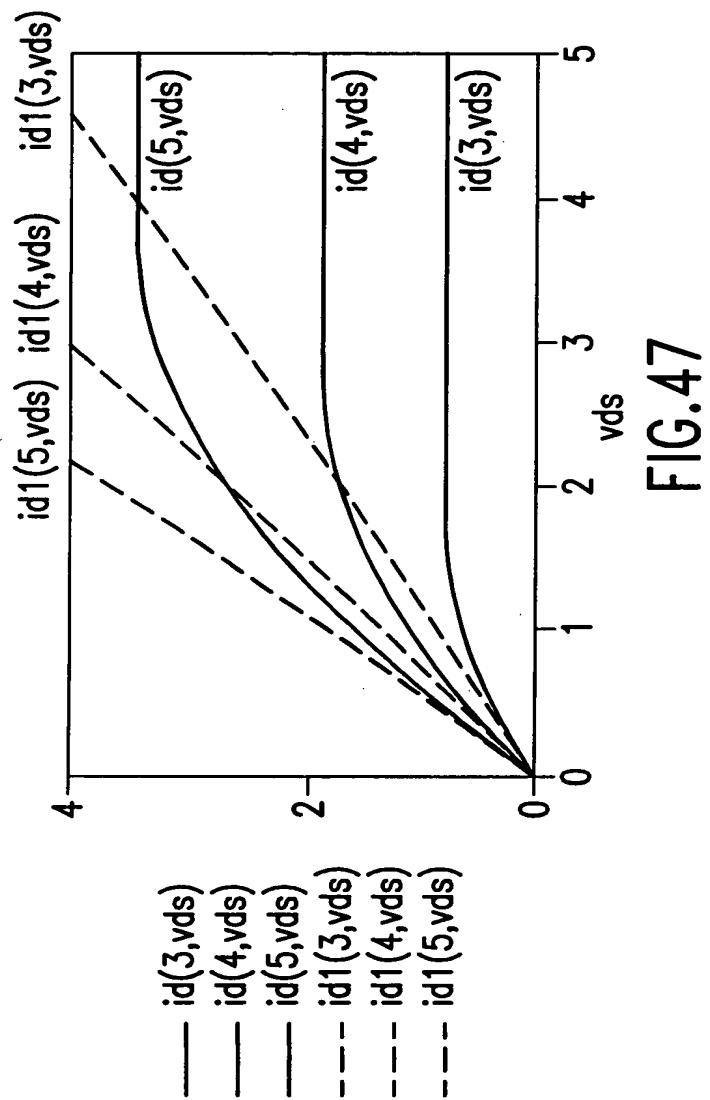


FIG.45E





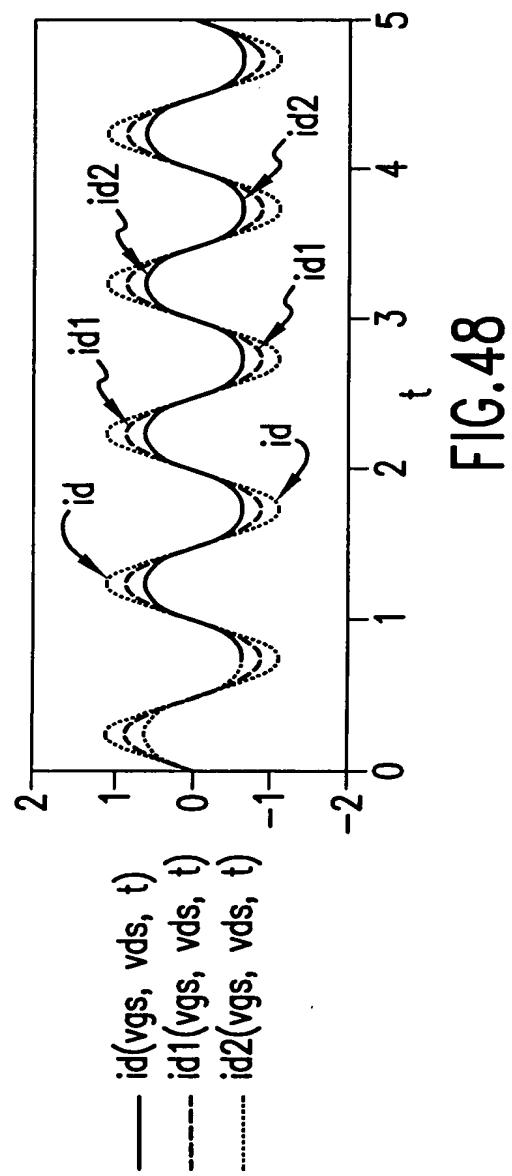


FIG. 48

Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals

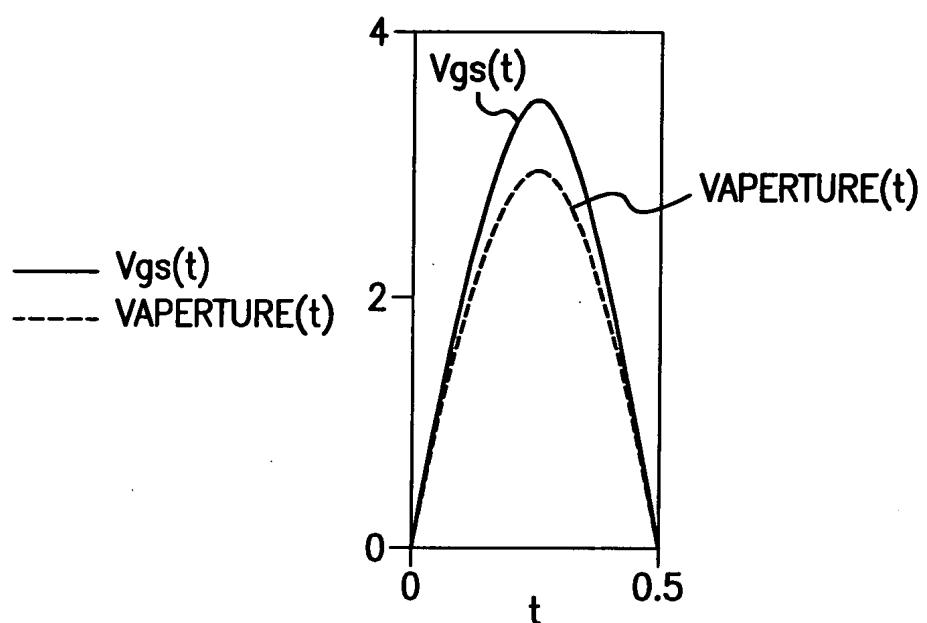
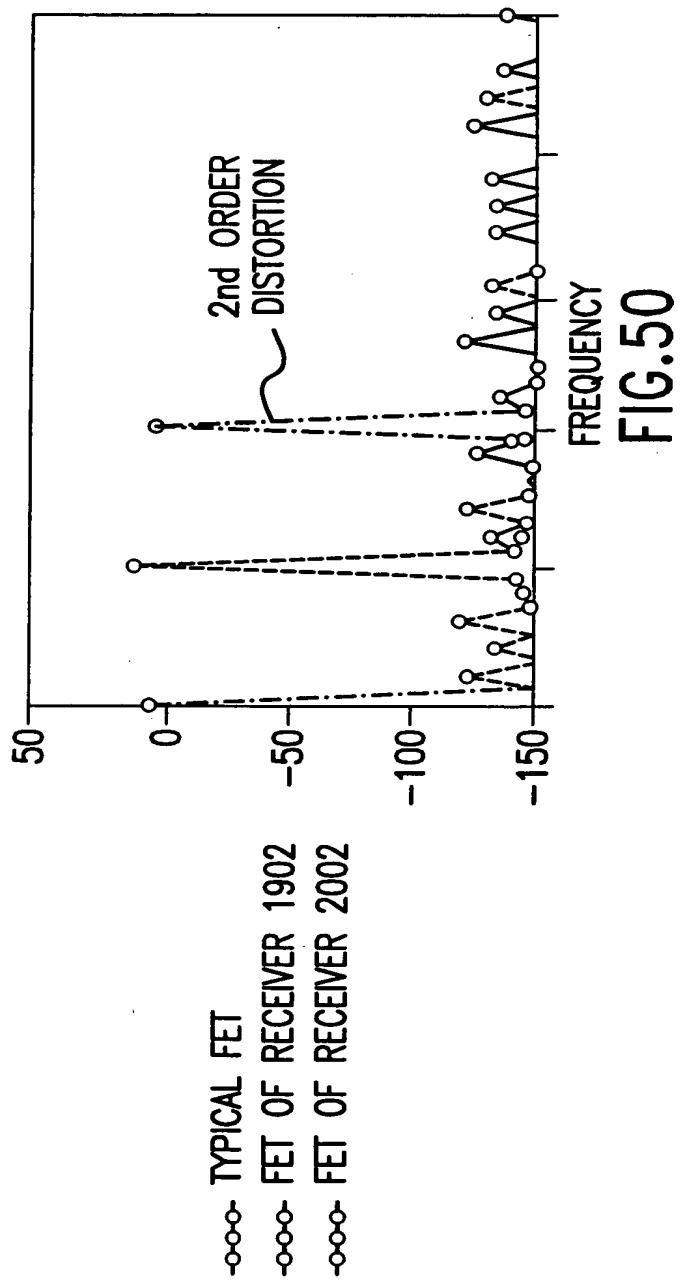
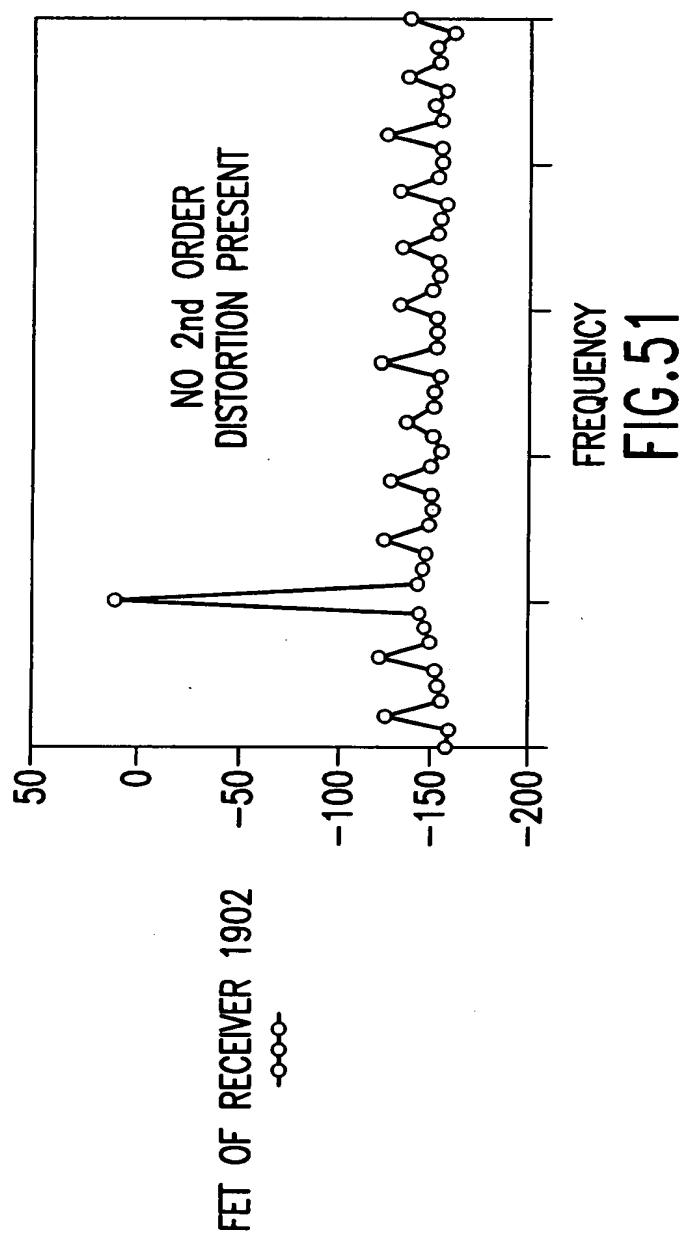


FIG.49

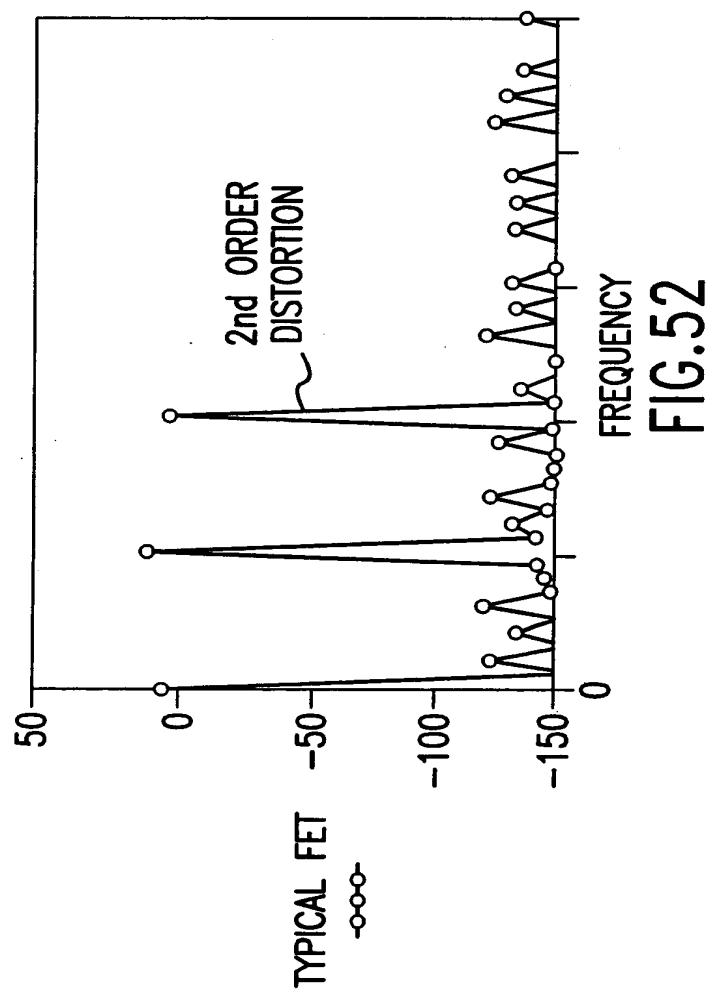
Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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and Up-Converting Electromagnetic Signals



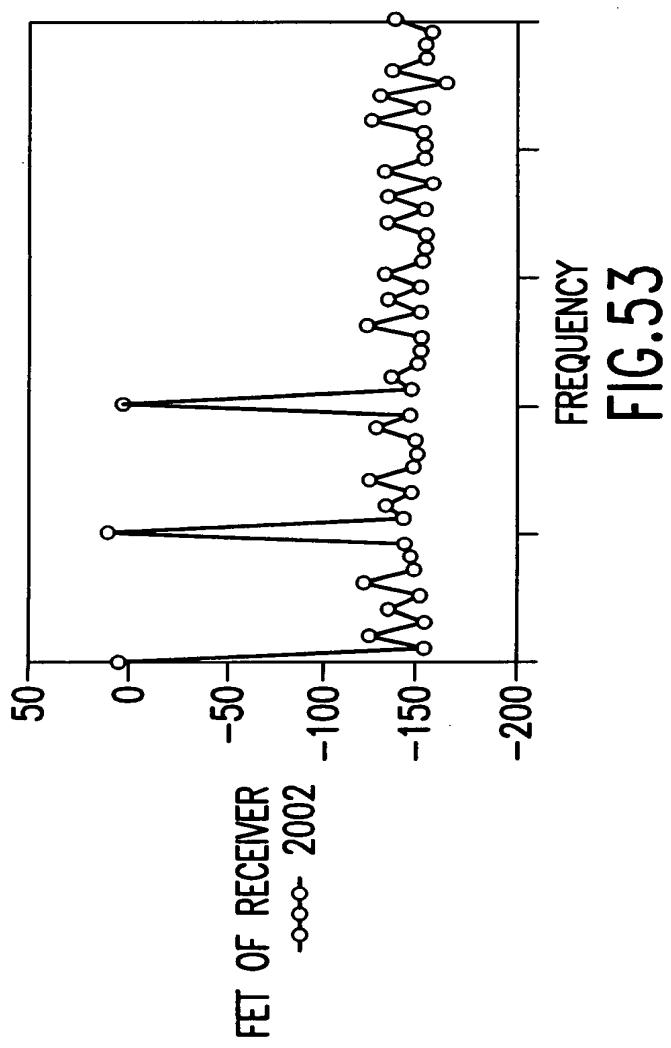
Appl. No. 09/855,851; Group Ari Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals



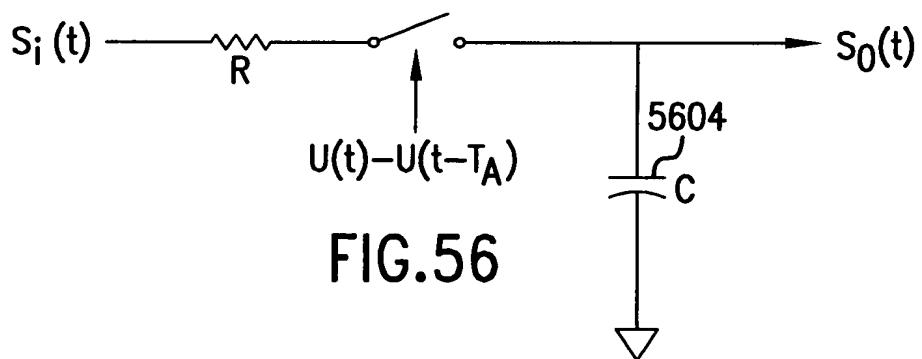
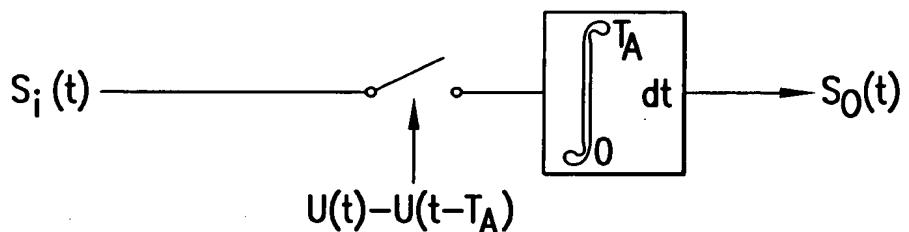
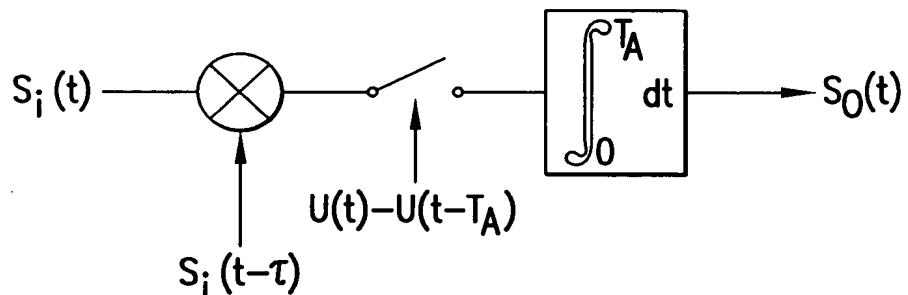
Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
Title: Apparatus, System, and Method for Down-Converting
and Up-Converting Electromagnetic Signals



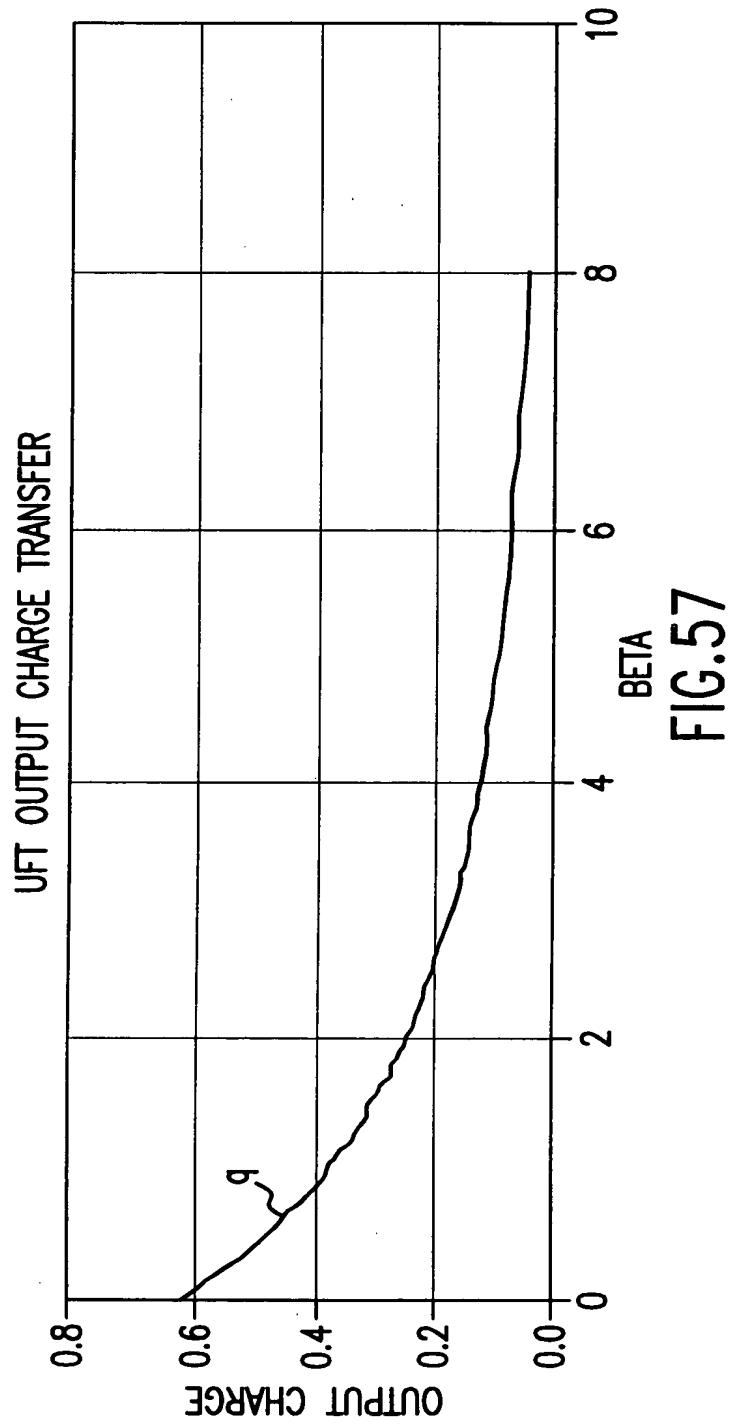
Appl. No. 09/855,851; Group Art Unit: 2681
Dkt. No. 1744.1260001; Batch No.: (to be assigned)
Inventor(s): Sorrells *et al.*; Tel: 202/371-2600
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and Up-Converting Electromagnetic Signals



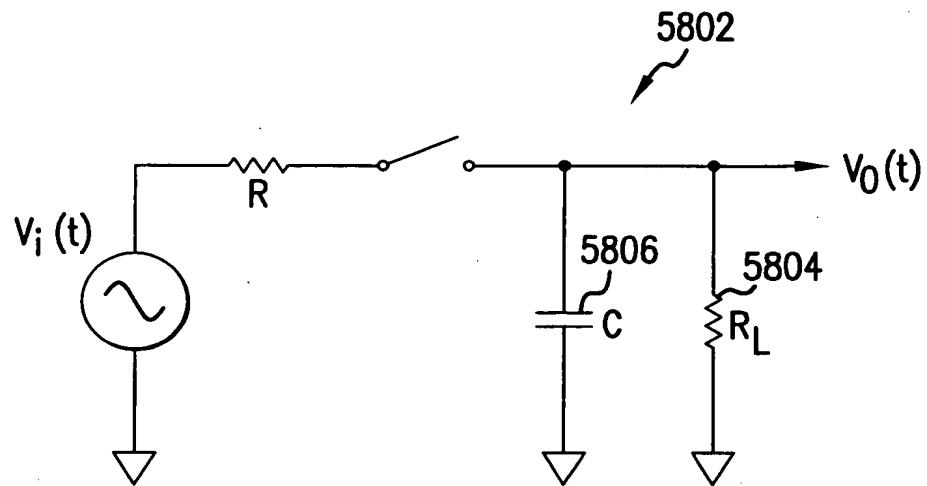


FIG.58

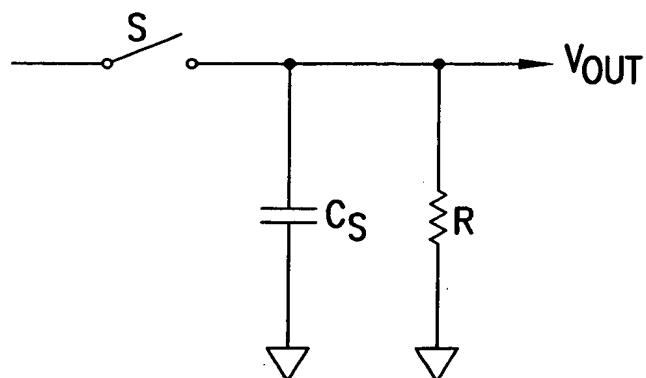
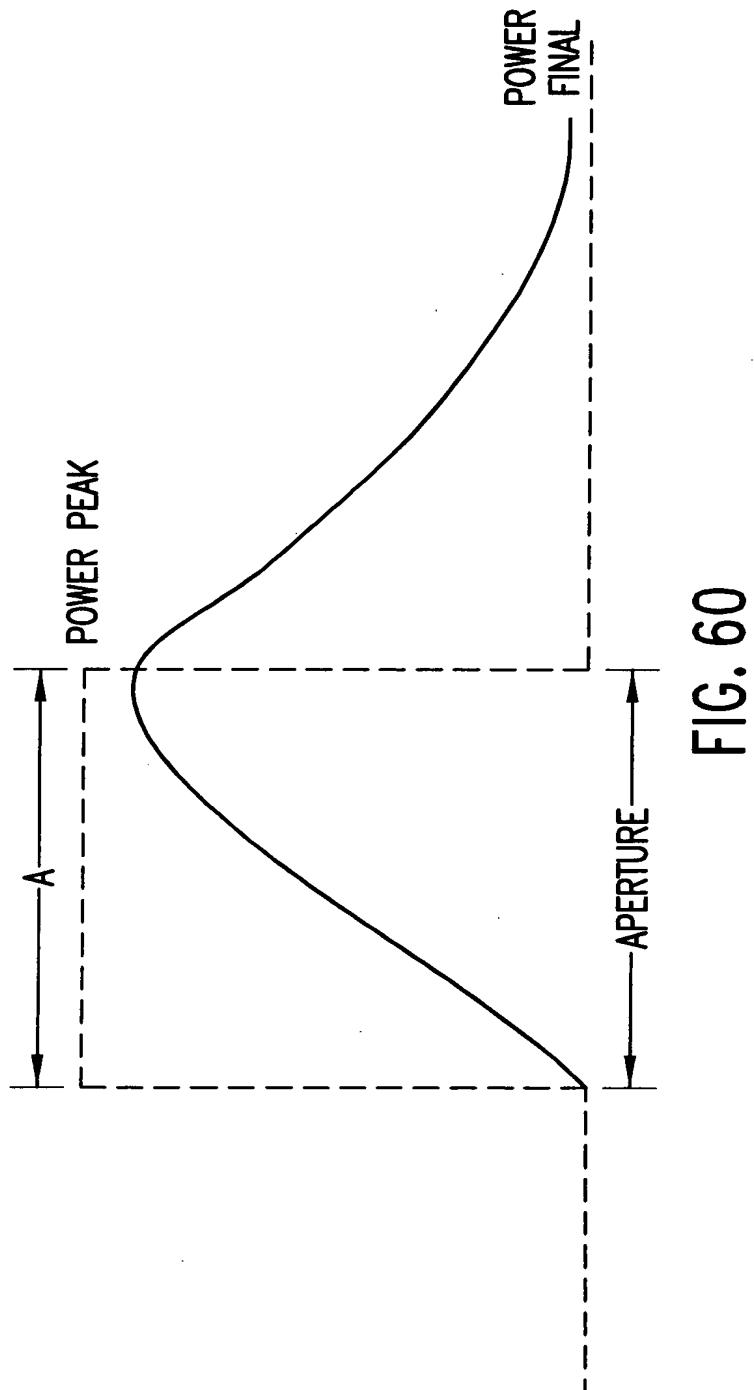
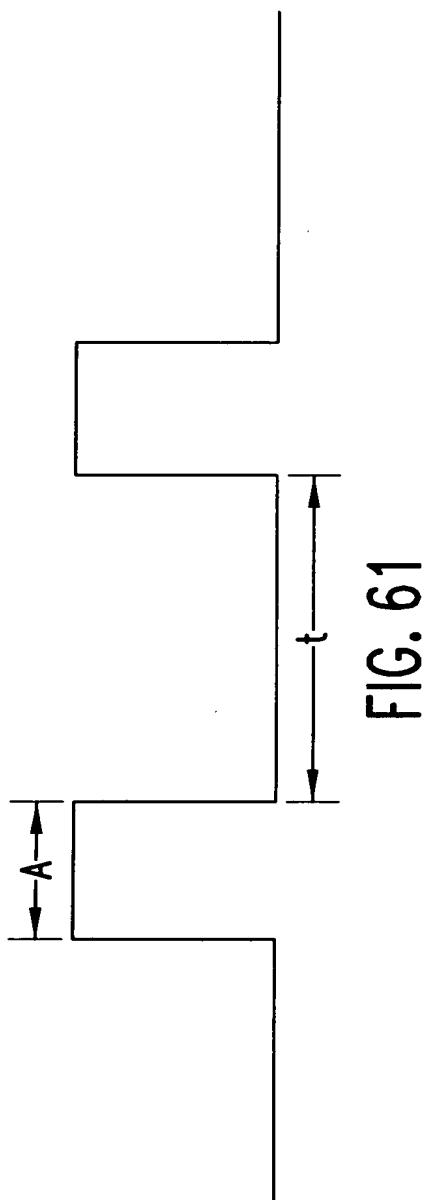


FIG.59





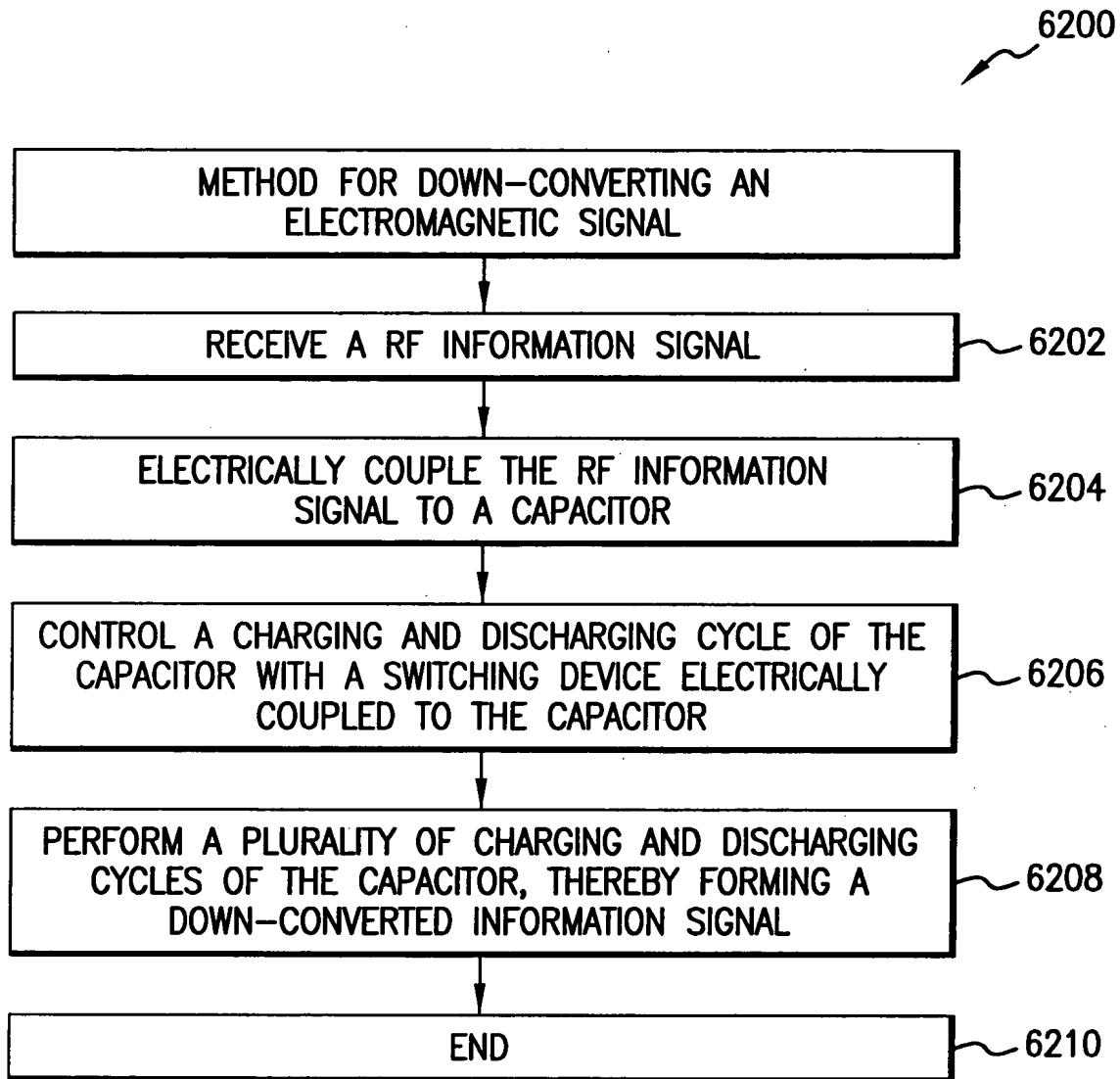


FIG.62